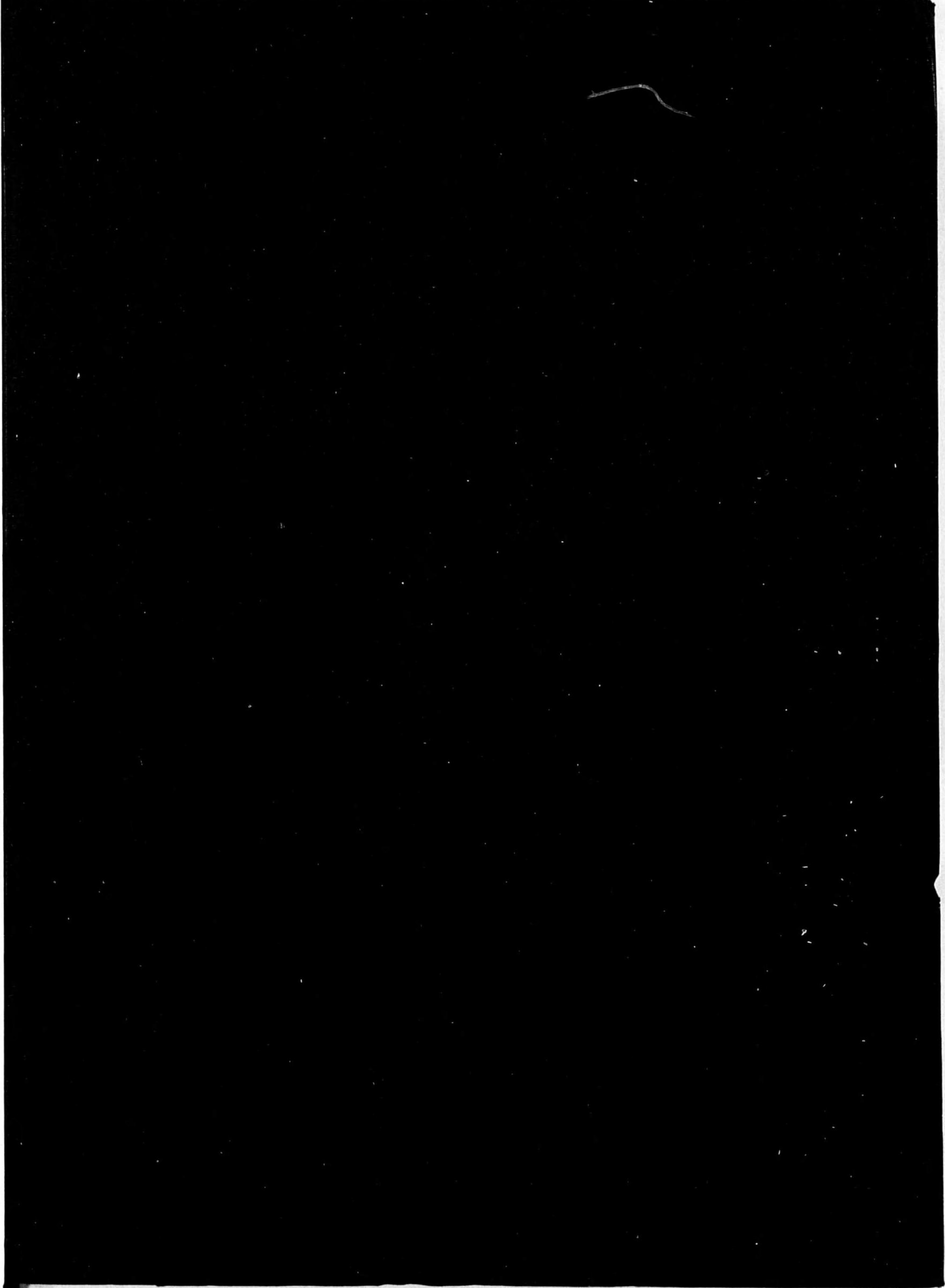




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鳥取高等農業學校學術報告

第三卷 第二號

昭和十一年十二月

MEMOIRS
OF THE
TOTTORI AGRICULTURAL COLLEGE
TOTTORI, NIPPON

Vol. III, No. 2

Naohide Hiratsuka :

A Contribution to the Knowledge of the
Rust-flora in the Alpine Regions of High
Mountains in Japan

Naohide Hiratsuka and Torama Yoshinaga :
Uredinales of Shikoku

PUBLISHED BY THE COLLEGE
TOTTORI
DECEMBER, 1935

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鳥取高等農業學校學術報告

第 三 卷

昭 和 十 年

MEMOIRS OF THE TOTTORI AGRICULTURAL COLLEGE TOTTORI, NIPPON

VOLUME III

TOTTORI
PUBLISHED BY THE COLLEGE
1935

日本植物学雑誌

第三卷

第三号

昭和十一年

五月

東京大学理学部植物学教室

東京市本郷区

植物学

日本植物学雑誌

第三卷

CONTENTS

Vol. III

-
1. Takeda, Kenzi:- Chemical studies on "Bukuryô", sclerotia of *Pachyma Holen*, Rumph. (I) The chemical structure of polysaccharose, β -pachyman, obtained from "Bukuryô" and its determination (With 2 plates) 1
 2. Hiratsuka, Naohide:- A contribution to the knowledge of the rust-flora in the alpine regions of high mountains in Japan 125
 3. Hiratsuka, Naohide and Torama Yoshinaga:- Uredinales of Shikoku 249

Corrections

- p. 162, 1. 27. for *resupinata* L. read *yezoensis* Maxim.
- p. 178, 1. 20. for Hoboro read Haboro.
- p. 192, 1. 12. for Mongr. read Monogr.
- p. 219, 1. 6. add Mt. Komagatake (Kiso).
- p. 278, 1. 23. for Mongr. read Monogr.
- p. 283, 1. 16. for Berkeley read Barclay.
- p. 312, 1. 32. for *Heteropogon* read *Holcus*.
- p. 340, table. for Manchuria & China read Manchuria & N. China.
- p. 368, 1. 6. for *Heteropogon* read *Holcus*.

5

[Contributions to the rust-flora of Eastern Asia~I]



With 1 map and 1 text-figure

CONTENTS

	Page
Introduction	127
Rust-flora in the alpine regions of mountains in Japan	127
I. Rust-flora in the alpine regions of Daisetsuzan mountain group, Hokkaidô	129
II. Rust-flora in the alpine regions of Mt. Iwate, Rikuchû Province, Honshû	138
III. Rust-flora in the alpine regions of Yatsugatake mountain range, Shinano Province, Honshû	145
IV. Rust-flora in the alpine regions of Mt. Tsubakuro-dake, Shinano Province, Honshû	151
V. Rust-flora in the alpine regions of Mt. Komagatake (Kiso), Shinano Province, Honshû	157
VI. Species of rust fungi found in the alpine regions of other mountains in Japan	163
VII. General aspect of rust-flora in the alpine regions of mountains in Japan	166
Biological classification of species of rust fungi found in the alpine regions of mountains in Japan	170
Comparisons of macrocyclic and microcyclic species of rust fungi found in the alpine regions of mountains	172
Correlation between the air temperatures and the relative increase of microcyclic species in the regions of high altitude and towards the north latitude	175
I. Approximate air temperatures in the alpine regions of Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)	176

(1) The present work has been partially aided by a grant from the Foundation for the Promotion of Scientific and Industrial Research of Japan.

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MEMOIRS OF THE
TOTTORI AGRICULTURAL COLLEGE

Vol. III, No. 2, pp. 125-377

Issued Dec. 25, 1935

A CONTRIBUTION TO THE KNOWLEDGE OF THE
RUST-FLORA IN THE ALPINE REGIONS OF
HIGH MOUNTAINS IN JAPAN⁽¹⁾

[Contributions to the rust-flora of Eastern Asia~I]

By
Naohide HIRATSUKA

With 1 map and 1 text-figure

CONTENTS

	Page
Introduction	127
Rust-flora in the alpine regions of mountains in Japan	127
I. Rust-flora in the alpine regions of Daisetsuzan mountain group, Hokkaidô	129
II. Rust-flora in the alpine regions of Mt. Iwate, Rikuchû Province, Honshû	138
III. Rust-flora in the alpine regions of Yatsugatake mountain range, Shinano Province, Honshû	145
IV. Rust-flora in the alpine regions of Mt. Tsubakuro-dake, Shinano Province, Honshû	151
V. Rust-flora in the alpine regions of Mt. Komagatake (Kiso), Shi- nano Province, Honshû	157
VI. Species of rust fungi found in the alpine regions of other moun- tains in Japan	163
VII. General aspect of rust-flora in the alpine regions of mountains in Japan	166
Biological classification of species of rust fungi found in the alpine regions of mountains in Japan	170
Comparisons of macrocyclic and microcyclic species of rust fungi found in the alpine regions of mountains	172
Correlation between the air temperatures and the relative increase of microcyclic species in the regions of high altitude and towards the north latitude	175
I. Approximate air temperatures in the alpine regions of Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)	176

⁽¹⁾ The present work has been partially aided by a grant from the Foundation
for the Promotion of Scientific and Industrial Research of Japan.

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	Page
II. Correlation between the air temperatures and the relative increase of microcyclic species in the northern districts	179
III. Conclusive summary of the data on correlation between the air temperatures and the relative increase of microcyclic species	179
Microsporic and leptosporic forms of microcyclic species of rust fungi found in the alpine regions of mountains	180
Geographical distribution of rust fungi found in the alpine regions of mountains in Japan	184
I. Distribution of species in Japan	184
II. Distribution of species in other regions of the world	223
III. Geographical elements of rust-flora in the alpine regions of mountains in Japan	227
IV. Rust-flora of the alpine regions of mountains in Japan compared with that of the same regions in Switzerland	228
General summary	230
Fungus index	232
Host index	237
Literature cited	244

14.5-421

INTRODUCTION

In ascending a high mountain it is soon noticed that the fungus flora changes and the number of fungus species, likewise their abundance, decreases with increasing elevation. Certain species disappear with increasing elevation, some are chiefly associated with particular floral zones, while others are more cosmopolitan being found in greater or less quantity at all elevations. Some species are strictly alpine in habit, are not found below certain elevations and exhibit particular adaptation to their environment. Among them are included many of the circumpolar arctic species which are of much interest phytogeographically.

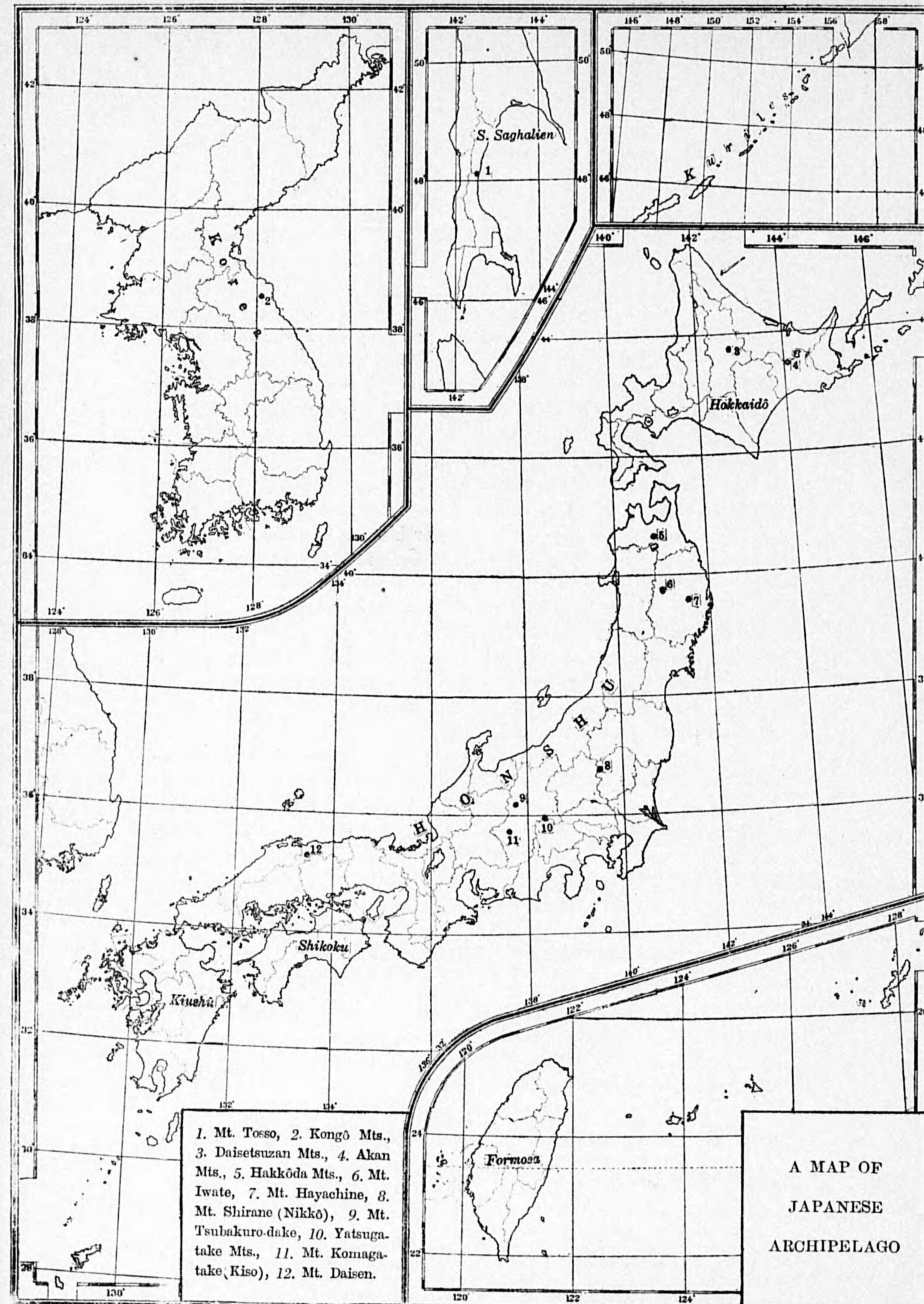
Published studies concerning rust-flora in the alpine regions of high mountains number comparatively few. Especially, there exists no special publication on this problem in our country, except a few papers prepared by Togashi & Ônuma (78) and the present writer (34,37,43).

In the course of his study on the taxonomy, biology and phylogeny of rust fungi, the writer has taken a special interest in the subject, and has made his own explorations in a number of high mountains in South Saghalien, Hokkaidô, Honshû and Korea for studying the rust-flora of the alpine regions. The present work is intended to report a part of those investigations.

The writer wishes to express his appreciation of the kind direction of Prof. Seiya Ito, Hokkaido Imperial University, and of the valuable advice given by Prof. Yoshihiko Tochinai, Hokkaido Imperial University and by Prof. Kogo Togashi, Imperial College of Agriculture and Forestry, Morioka. The writer also expresses his heartiest thanks to Dr. Gentarô Yamada, the director of our College for his courtesy extended during the work.

RUST-FLORA IN THE ALPINE REGIONS OF MOUNTAINS IN JAPAN

For the purpose of investigation on the rust-flora in the alpine regions within Japanese territory, the writer has made his own exploration of these regions of a number of mountains in South Saghalien, Hokkaidô, Honshû and Korea. Especially, careful observations were made on the rust-flora of the following five mountains, because the alpine floras of phanerogams of these mountains



are representative in our country. They are: 1) the Daisetsuzan mountain group, Ishikari Province, Hokkaidō, 2) Mt. Iwate, Rikuchū Province, Northern Honshū, 3) Yatsugatake mountain range, Shinano Province, Middle Honshū, 4) Mt. Tsubakuro-dake, Shinano Province, Middle Honshū, and 5) Mt. Komagatake (Kiso), Shinano Province, Middle Honshū. Moreover, the writer also has investigated a number of species of rust fungi obtained from the alpine regions of other mountains in South Saghalien, Hokkaidō, Honshū and Korea, such as; Mt. Kashipo (*South Saghalien*), Mt. Tosso (*South Saghalien*), Mt. Rishiri (*Hokkaidō*), Akan Mts. (*Hokkaidō*), Hakkōda Mts. (*Northern Honshū*), Mt. Yakeishi-dake (*Northern Honshū*), Mt. Hayachine (*Northern Honshū*), Mt. Shirane (*Nikkō*) (*Middle Honshū*), Mt. Shirouma-dake (*Middle Honshū*), Kongōsan Mts. (*Korea*) and others.

In the following pages, all species of rust fungi (excluding unconnected species of *Accidium* and *Uredo*) found in the alpine regions of these mountains are enumerated. The alpine regions, treated in the present paper, include alpine meadow and shrubby zone, in which *Pinus pumila* Rgl. and *Betula Ermani* Cham. (or its varieties) always predominate, above the forest zone, following the opinion of most phytogeologists and plant ecologists at the present day. The altitudes at which the shrubby zone in the above five mountains begins are as follows: -

- | | |
|-------------------------------|-----------------------------|
| 1) Daisetsuzan mountain group | 1500~1600m above sea-level. |
| 2) Mt. Iwate | 1500~1800m above sea-level. |
| 3) Yatsugatake mountain range | 2400~2600m above sea-level. |
| 4) Mt. Tsubakuro-dake | 2400~2500m above sea-level. |
| 5) Mt. Komagatake (Kiso) | 2500~2600m above sea-level. |

The writer also obtained a number of specimens of rust fungi including many interesting species from the alpine regions of some high mountains in Formosa, such as; Mts. Niitaka, Nanko, Arisan, Taiha and others, most of which were collected by Mr. Yoshio Hashioka. But, in this paper no discussion has been included concerning these species found in Formosa.

I. Rust-flora in the alpine regions of Daisetsuzan mountain group, Hokkaidō

The Daisetsuzan mountain group, the highest one in northern Japan, lies nearly in the middle of the main island of Hokkaidō.

It extends from 43° 37' to 43° 50' N. Lat. and from 142° 20' to 143° 3' E. Long. Asahi-dake (2290.3m), the highest peak in this mountain group is so situated that the meridian of 142° 52' East of Greenwich and the parallel of 43° 39' North intersect near its summit. This mountain group is volcanic and it consists of about twenty peaks, among which the following eight are well known. They are: Asahi-dake, Hokuchin-dake (2246m), Hakuun-dake (2229 m), Ryōun-dake (2131m), Kuro-dake (1984m), Hokkai-dake (2161 m), Aibetsu-dake (2112m) and Pippu-dake (2191m).

From about ten years since, many botanists have taken a special interest in the alpine flora of this mountain group, because it is very rich in species some of which are endemic or uncommon ones in our country. The alpine vegetation in this mountain group is also the most beautiful in northern Japan.

In his "Studies on the Melampsoraceae of Japan" (1927), the writer (19) first recorded the following 11 species of rust fungi from this mountain group, based upon his collections. They are:

1. *Pucciniastrum Circaeae* (Thüm.) Speg.
2. *P. Goodyerae* Arth.
3. *P. Hydrangeae-petiolaridis* Hirats. f.
4. *Thekopsora areolata* (Fr.) P. Magn.
5. *Th. Myrtillina* Karst.
6. *Th. sparsa* (Wint.) P. Magn.
7. *Th. Tripetaleiae* Hirats. f.
8. *Th. Vacciniorum* Karst.
9. *Chrysomyxa Empetri* Schröt.
10. *Ch. Ledi* De Bary.
11. *Ch. ledicola* Lagerh.

Since then, the following 42 species have been also reported by Kamei (59) and the writer (20,23,27,28,33,34,43,46), up to the present time. They are:

1. *Uromyces Cacaliae* (DC.) Unger.
2. *U. Solidaginis* (Sommerf.) Niessl.
3. *U. Peracarpae* Ito et Tochinai.
4. *Puccinia Adoxae* Hedw. f.
5. *P. asiatica* (Kom.) Syd.
6. *P. Campanulae* Carmich.
7. *P. Chrysosplenii* Grev.
8. *P. calumnata* Syd.

9. *Puccinia Circaeae* Pers.
10. *P. Epilobii* DC.
11. *P. hakkodensis* Hirats. f.
12. *P. Hultenii* Tranzsch. et Jørstad.
13. *P. Majanthemi* Diet.
14. *P. porphyrogenita* Curt.
15. *P. Saxifragae* Schlecht.
16. *P. Schizonepetae* Tranzsch.
17. *P. Trautvetteriae* Syd. et Holw.
18. *P. Veronicarum* DC.
19. *P. vesiculosa* Schlecht.
20. *P. uralensis* Tranzsch.
21. *P. Waldsteiniae* Curt.
22. *P. Violae-glabellae* Miura.
23. *Phragmidium Itoanum* Hirats. f.
24. *Ph. alpinum* Hirats. f.
25. *Ph. Miyabeanum* Ito et Hirats. f.
26. *Ph. Nambuanum* Diet.
27. *Ph. pauciloculare* (Diet.) Syd.
28. *Ph. Rubi-Idaei* (DC.) Karst.
29. *Ph. Rubi-japonici* Kasai.
30. *Xenodochus minor* Arth.
31. *Melampsora Kusanoi* Diet.
32. *M. Larici-epitea* Kleb.
33. *Chnoopsora Itoana* Hirats. f.
34. *Melampsorella Caryophyllacearum* Schröt.
35. *Thekopsora guttata* (Schröt.) Syd.
36. *Calyptospora Goepfertiana* Kühn.
37. *Hyalopsora hakodatensis* Hirats. f.
38. *H. Yamadana* Hirats. f.
39. *Milesina jezoensis* Kamei et Hirats. f.
40. *Chrysomyxa alpina* Hirats. f.
41. *Cronartium kamtschaticum* Jørstad.
42. *Coleosporium Saussureae* Thüm.

Therefore, the total number of rust fungi which have been recorded from this mountain group is 53.

The writer's first visit to the Daisetsuzan mountain group was paid in August 1925 for the purpose of collecting rust fungi. This was the first collection of rust fungi therefrom. Since then, the

writer visited this mountain group some six times at different seasons, and a large number of specimens of rust fungi have been collected from this mountain group. Besides these collections, several specimens which were collected by Y. Tokunaga, Y. Imai, H. Kataoka and others have been examined.

The following list is an enumeration of species of the rust fungi which were found in the alpine regions of this mountain group.

1. **Uromyces Cacaliae** (DC.) Unger, *Einfl. Bod. Vert. Ges.* p. 216, 1836. (Hiratsuka, f. in *Bot. & Zool.* II, p. 545, 1934; *Transact. Tottori Soc. Agric. Sci.* III, p. 216, 1931).

On *Cacalia auriculata* DC. var. *kamtschatica* Koidz. (*Mimikōmori*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.).

2. **Uromyces Solidaginis** (Sommerf.) Niessl in *Verh. Nat.-Ver. Brünn*, X, p. 163 & pl. III, fig. 10, 1872. (Hiratsuka, f. in *Transact. Tottori Soc. Agric. Sci.* III, p. 216, 1931; *Bot. & Zool.* II, p. 545, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsō*). Mt. Kuro-dake (Aug., 1925 & Aug., 1927, Hiratsuka, f.; Sept., 1929, M. Okamoto); *Kumonotaira* (Aug., 1926, Hiratsuka, f.); Mt. Ushiro-asahi (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Mt. Hakuun-dake (July, 1926, Hiratsuka, f.); Mt. Hokkai-dake (Sept., 1926, Hiratsuka, f.).

3. **Puccinia calthaecola** Schröter in *Beitr. Biol. Pfl.* III, p. 61, 1879.

On *Caltha palustris* L. var. *typica* Rgl. (*Yezo-ryūkinkwa*). Hokkai-sawa (Sept., 1926, Hiratsuka, f.).

4. **Puccinia calumnata** Sydow in *Ann. Myc.* XI, p. 102, 1913. (Hiratsuka, f. in *Bot. & Zool.* II, p. 545, 1934).

On *Pleuropterygium Weyrichii* H. Gross. var. *alpicolum* Koidz. (*Takane-urajiro-itadori*). Mt. Kuro-dake (Sept., 1926, Hiratsuka, f.); Hokkai-sawa (Sept., 1926, Hiratsuka, f.).

5. **Puccinia Campanulae** Carmichael in *Berkeley in Smith, Engl. Fl.* V, (pt. 2), p. 365, 1836. (Hiratsuka, f. in *Transact. Tottori Soc. Agric. Sci.* III, p. 216, 1931; *Bot. & Zool.* II, p. 545, 1934).

On *Campanula lasiocarpa* Cham. (*Iwa-gikyō*). Mt. Ushiro-asahi (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Hakuun-sawa (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

6. **Puccinia Circaeae** Persoon in *Neues Mag. Bot.* I, p. 119, 1794; *Syn. Fung.* p. 228, 1801. (Hiratsuka, f. in *Transact. Tottori Soc. Agric. Sci.* III, p. 217, 1931; *Bot. & Zool.* II, p. 545, 1934).

On *Circaea alpina* L. (*Miyama-tanitade*). Mt. Kuro-dake (Aug., 1925, K. Miyabe & Hiratsuka, f.).

7. **Puccinia Epilobii** de Candolle in *Fl. franç.* II, p. 221, 1805; VII, p. 61, 1815. (Hiratsuka, f. in *Ann. Myc.* XXVIII, p. 278, 1930; *Transact. Tottori Soc. Agric. Sci.* III, p. 217, 1931; *Bot. & Zool.* II, p. 545, 1934).

On *Epilobium Hornemanii* Rehb. (*Yezo-miyama-akabana*). Hokkai-sawa (Aug., 1925, K. Miyabe, Hiratsuka, f. & I. Tanaka; Sept., 1926, Hiratsuka, f.).

8. **Puccinia Hultenii** Tranzschel et Jørstad in *Jørstad in Skr. utgitt av Det Norske Vid.-Akad. Oslo*, I. *Matem.-Nat. Kl.* no. 9 (1933), p. 107 & fig. 7, 1934. (Hiratsuka, f. in *Jour. Jap. Bot.* X, p. 620 & fig. 16, 1935). *Syn. Puccinia Rumicis-scutati* (not Wint.) (Hiratsuka, f. in *Ann. Myc.* XXVIII, p. 279, 1930; *Bot. & Zool.* II, p. 545, 1934).

On *Rumex arifolius* All. (*Rumex montanus* Desf.) (*Takane-suiba*). Mt. Kuro-dake (Aug., 1925, Sept., 1926 & Aug., 1927, Hiratsuka, f.; July, 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

9. **Puccinia Majanthemi** Dietel in *Engl. Bot. Jahrb.* XXVIII, p. 285, 1900. (Hiratsuka, f. in *Transact. Tottori Soc. Agric. Sci.* III, p. 217, 1931; *Bot. & Zool.* II, p. 545, 1934).

On *Majanthemum dilatatum* Nels. et Macbr. (*Maidzurusō*). Mt. Kuro-dake (Aug., 1925, K. Miyabe & Hiratsuka, f.; Aug., 1927, Hiratsuka, f.).

10. **Puccinia Nanbuana** Hennings in *Hedwigia* XL, p. (26), 1901.

On *Peucedanum multivittatum* Maxim. (*Hakusan-bōfū*). Mt. Ushiro-asahi (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

11. **Puccinia porphyrogenita** Curtis in *Thümen, Myc. univ.*

no. 545, 1876. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934).

On *Chamaepericlymenum canadense* Aschers. et Graebn. (*Cornus canadensis* L.) (*Gozen-tachibana*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.); Takanegahara (May, 1929, M. Okamoto).

12. **Puccinia Saxifragae** Schlechtendal, Fl. Berol. II, p. 134, 1824. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934).

On *Saxifraga fusca* Maxim. (*Kurokumosô*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

13. **Puccinia Trautvetteriae** Sydow et Holway in Sydow, Monogr. Ured. I, p. 552 & pl. XXXII, fig. 432, 1903. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934).

On *Trautvetteria japonica* Sieb. et Zucc. (*Trautvetteria palmata* Fisch. et Mey. var. *japonica* Huth.) (*Momijikaramatsu*). Mt. Kuro-dake (Aug., 1925, July, 1926 & Sept., 1927, Hiratsuka, f.; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.).

14. **Puccinia Veronicarum** de Candolle in Fl. franç. II, p. 594, 1805. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934).

On *Veronica yezoensis* Nakai (*Miyama-kuwagata*). Yukino-sawa (Sept., 1926, Hiratsuka, f.); Kumonotaira (Aug., 1925, Hiratsuka, f.); Hakuun-sawa (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Mt. Goshiki-dake (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

15. **Puccinia vesiculosa** Schlechtendal, in Ehrenb., Fung. Chamiss., p. 97, 1820. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934).

On *Anemone narcissiflora* L. var. *sachalinensis* Miyabe et T. Miyake (*Yezo-no-hakusan-ichige*). Mt. Kuro-dake (July, 1926, S. Ito & Hiratsuka, f.; Aug., 1925 & Aug., 1927, Hiratsuka, f.); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.); Daifukwakô (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Yukino-sawa (Sept., 1926, Hiratsuka, f.); Mt. Hokkai-dake (Sept., 1926, Hiratsuka, f.).

16. **Puccinia Violae-glabellae** Miura in Sydow in Ann. Myc. XI, p. 101 & text-fig., 1913. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Viola crassa* Mak. (*Takane-sumire*). Mt. Hokkai-dake (Sept., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

17. **Phragmidium alpinum** Hiratsuka, f. in Ann. Myc. XXVIII, p. 280, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 545, 1934; Jap. Jour. Bot. VII, p. 244, 1935).

On *Rubus pedatus* Sm. (*Kogane-ichigo*). Mt. Kuro-dake (Aug., 1925, & Sept., 1926, Hiratsuka, f., type!; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Kumonotaira (Sept., 1926, Hiratsuka, f.).

18. **Phragmidium Itoanum** Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. XIII, p. 134, 1934. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934; Jap. Jour. Bot. VII, p. 271, 1935).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). Mt. Hokkai-dake (Sept., 1926, Hiratsuka, f.); Kumonotaira (Aug., 1925, K. Miyabe & Hiratsuka, f.; Sept., 1926, Hiratsuka, f.); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.); Hokkai-sawa (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare, type!).

19. **Phragmidium Miyabeianum** Ito et Hiratsuka, f. in Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 1931; Bot. & Zool. II, p. 546, 1934; Jap. Jour. Bot. VII, p. 258, 1935).

On *Sieversia pentapetala* Greene (*Geum pentapetalum* Mak.) (*Chinguruma*). Kumonotaira (Aug., 1925, K. Miyabe, Hiratsuka, f. & I. Tanaka; Sept., 1926, Hiratsuka, f.); Mt. Kuro-dake (Sept., 1926, Hiratsuka, f., type!; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Mt. Hokkai-dake (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

20. **Xenodochus minor** Arthur in N. Amer. Fl. VII, p. 182, 1921. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 130, 1934; Bot. & Zool. II, p. 546, 1934).

On *Sanguisorba sitchensis* Trautv. et Mey. (*Takane-tôchisô*). Hakuun-sawa (Aug., 1927, Hiratsuka, f.).

21. **Melampsora Kusanoi** Dietel in Engl. Bot. Jahrb. XXXVII,

p. 104, 1905. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 291, 1927; Bot. & Zool. II, p. 546, 1934).

On *Hypericum kamtschaticum* Ledeb. (*Iwa-otogiri*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.; Aug., 1925, K. Miyabe & Hiratsuka, f.); Goshiki-taira (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

22. **Chnoospora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 287, 1927.

On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.; Aug., 1925, K. Miyabe & Hiratsuka, f.; Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

23. **Thekopsora Myrtilina** Karsten, Myc. Fenn. IV, p. 59, 1879. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 309, 1927; Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 19, 1927; Bot. Mag. Tokyo, XLIII, p. 16, 1929; Bot. & Zool. II, p. 546, 1934).

On *Vaccinium axillare* Nakai (*Kuro-usugo*). Mt. Kuro-dake (Aug., 1933, Hiratsuka, f.).

On *Vaccinium Chamissonis* Bong. (*Yezo-kuro-usugo*). Mt. Kuro-dake (Aug., 1933, Hiratsuka, f.).

On *Vaccinium Smallii* A. Gray (*Oba-sunoki*). Mt. Kuro-dake (Aug., 1933, Hiratsuka, f.).

On *Vaccinium uliginosum* L. (*Kuromame-no-ki*). Kumonotaira (Sept., 1926, Hiratsuka, f.); Mt. Kuro-dake (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare; Aug., 1933, Hiratsuka, f.); Daifunkwakô (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

24. **Thekopsora sparsa** (Wint.) Magnus in Dalla Torre & Sarnth., Fl. Tirol, III, p. 118, 1905. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 24, 1927; Jap. Jour. Bot. III, p. 308, 1927; Bot. Mag. Tokyo, XLIII, p. 19, 1929; Bot. & Zool. II, p. 546, 1934).

On *Arctous japonicus* Nakai (*Kuma-kokemomo*). Mt. Kuro-dake (Sept., 1926, Hiratsuka, f.).

25. **Thekopsora Tripetaleiae** Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 23, 1927. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 308, 1927; Bot. Mag. Tokyo, XLIII, p. 18, 1929; Bot. & Zool. II, p. 546, 1934).

On *Tripetaleia bracteata* Maxim. (*Miyama-hotsutsuji*). Mt. Kuro-

dake (Sept., 1926, Hiratsuka, f.).

26. **Thekopsora Vacciniorum** Karsten, Myc. Fenn. IV, p. 58, 1879. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 20, 1927; Jap. Jour. Bot. III, p. 309, 1927; Bot. Mag. Tokyo, XLIII, p. 15, 1929; Bot. & Zool. II, p. 546, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). Kumonotaira (Sept., 1926, Hiratsuka, f.).

27. **Calyptospora Goeppertiana** Kühn in Hedwigia VIII, p. 81, 1869. (Hiratsuka, f. in Bot. & Zool. II, p. 546, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). Mt. Hakuun-dake (Aug., 1933, Hiratsuka, f.).

28. **Chrysomyxa alpina** Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 471, 1929. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. IV, p. 114, 1932; Bot. & Zool. II, p. 546, 1934). Syn. *Chrysomyxa expansa* (not Dietel) (Hiratsuka, f. in Jap. Jour. Bot. III, p. 314, 1927).

On *Rhododendron chrysanthum* Pall. (*Kibana-shakunage*). Mt. Kuro-dake (July, 1926, S. Ito & Hiratsuka, f.; Aug., 1925, Hiratsuka, f.); Mt. Eboshi-dake (Aug., 1925, Hiratsuka, f.); Kumonotaira (Aug., 1925, & July, 1928, Hiratsuka, f.; July, 1926, S. Ito & Hiratsuka, f.); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.).

29. **Chrysomyxa Empetri** Schröter in Krypt. Fl. Schles. III, 1, p. 372, 1887. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 33, 1927; Jap. Jour. Bot. III, p. 316, 1927; Bot. Mag. Tokyo, XLIII, p. 475, 1929; Bot. & Zool. II, p. 546, 1934).

On *Empetrum nigrum* L. (*Gankôran*). Mt. Kuro-dake (July, 1926, S. Ito & Hiratsuka, f.).

30. **Chrysomyxa Ledi** De Bary in Bot. Zeitg. XXXVII, p. 809 & Tab. X, figs. 7 & 8, 1879. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 34, 1927; Jap. Jour. Bot. III, p. 315, 1927; Bot. Mag. Tokyo, XLIII, p. 468, 1929; Bot. & Zool. II, p. 546, 1934).

On *Ledum palustre* L. var. *yesoense* Nakai (*Yezo-isotsutsuji*). Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.); Hakuun-sawa (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

31. **Chrysomyxa ledicola** Lagerheim in Tromsø Mus. Aarsh. XVI, p. 119, 1893. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaido Imp. Univ. XXI, p. 35, 1927; Jap. Jour. Bot. III, p. 315, 1927; Bot. Mag. Tokyo, XLIII, p. 469, 1929; Bot. & Zool. II, p. 546, 1934).

On *Ledum palustre* L. var. *procumbens* Ait. (*Hime-isotsutsuji*). Mt. Hokkai-dake (Aug., 1925, K. Miyabe & Hiratsuka, f.; Aug., 1925, Hiratsuka, f.); Mt. Hakuun-dake (Aug., 1925, Hiratsuka, f.); Mt. Kuro-dake (Aug., 1925, Hiratsuka, f.; July, 1928, H. Kataoka; July, 1926, S. Ito & Hiratsuka, f.; Aug., 1925, K. Miyabe & Hiratsuka, f.); Kumonotaira (Aug., 1925, K. Miyabe & Hiratsuka, f.; July, 1926, S. Ito & Hiratsuka, f.).

32. **Cronartium kamtschaticum** Jørstad in Skrift. utgitt av Det Norske Videnskaps-Akad. i Oslo I. Matem.-Nat. Klasse, no. 9 (1933), p. 27, 1934. Syn. *Cronartium Pedicularis* (not Lindr.) (Hiratsuka, f. in Bot. & Zool. II, p. 546, 1934).

On *Pinus pumila* Rgl. (*Hai-matsu*). Mt. Kuro-dake (July, 1926, S. Ito & Hiratsuka, f.); Kumonotaira (July, 1926, Hiratsuka, f.).

On *Pedicularis Oederi* Vahl. (*Chishima-shiogama*). Hakuun-sawa (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

33. **Coleosporium Saussureae** Thümen in Bull. Soc. Imp. Nat. Moscou, LV, p. 212, 1880. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 222, 1927; Bot. & Zool. II, p. 546, 1934).

On *Pinus pumila* Rgl. (*Hai-matsu*). Mt. Kuro-dake (July, 1926, S. Ito & Hiratsuka, f.).

On *Saussurea Riederi* Herd. (*Kita-azami*). Mt. Kuro-dake (Aug., 1925 & Sept., 1926, Hiratsuka, f.; Aug., 1925, K. Miyabe & Hiratsuka, f.); Goshiki-taira (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare); Yukino-sawa (Sept., 1926, Hiratsuka, f.).

On *Saussurea Tilesii* Ledeb. var. *nivea* Koidz. (*Yukiba-tôhiren*). Mt. Kuro-dake (Aug., 1927, S. Ito, Hiratsuka, f. & S. Iwadare).

II. Rust-flora in the alpine regions of Mt. Iwate, Rikuchû Province, Honshû

Mt. Iwate is the highest in the Ôu volcanic mountain range in northern Honshû. It has been often called "Ganjyu-san" or

"Nambu-Fuji". The highest peak of this mountain lies in the latitude 39° 51' north and in the longitude 141° 0' east, and attains a height of 2040.5 meters.

In 1906, Miyake (68) recorded that *Puccinia Angelicae-edulis* T. Miyake (*Puccinia Nanbuana* P. Henn.) on *Angelica edulis* Miyabe was collected by G. Yamada in this mountain. This is the first record of rust fungi from this mountain. Since then, the following ten species of rust fungi have been reported by Kasai (60), Ito (52), Togashi & Onuma (78) and the writer (18, 19, 23, 28, 46) from the same mountain. They are:

1. *Uromyces Solidaginis* (Sommerf.) Niessl.
2. *Phragmidium Rosae-multiflorae* Diet.
3. *Ph. Rubi-japonici* Kasai.
4. *Xenodochus carbonarius* Schlecht.
5. *Blastospora Itoana* Togashi et Onuma.
6. *Pucciniastrum Agrimoniae* (Diet.) Tranzsch.
7. *P. Fagi* Yamada.
8. *P. Pyrolae* (Karst.) Schröt.
9. *Thekopsora Tripetaleiae* Hirats. f.
10. *Coleosporium Saussureae* Thüm.

As far as the writer knows, the first collection of rust fungi from this mountain was made by Dr. K. Miyabe who climbed this mountain for making a botanical collection in September 1893.

Since then, a number of specimens of rust fungi were collected by Y. Takahashi, Naoharu Hiratsuka, G. Yamada, K. Sawada, K. Togashi and others therefrom. In August of 1935, Togashi and the writer made a mycological survey for this mountain, and obtained about 70 specimens of rust fungi from its alpine regions.

In the following, the 31 species of rust fungi including three new species found in the alpine regions of this mountain are enumerated.

1. **Uromyces Rudbeckiae** Arthur et Holway in Arthur in Bull. Iowa Agric. Coll. Dept. (1884), p. 154, 1884.

On *Solidago Virgaurea* L. (*Akinokirinsô*). Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

2. **Uromyces Solidaginis** (Sommerf.) Niessl in Verh. Nat.-Ver. Brünn, X, p. 163 & pl. III, fig. 10, 1872. (Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 214, 1922).

On *Solidago Virgaurea* L. (*Akinokirinsô*). Aug., 1897, Y. Takahashi; Aug., 1903 & Sept., 1912, G. Yamada; Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

3. **Uromyces Veratri** (DC.) Schröter in Abh. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLVIII (1869~72), p. 10, 1870.

On *Veratrum stamineum* Maxim. (*Ko-baikeisô*). July, 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

4. **Puccinia asiatica** (Kom.) Sydow, Monogr. Ured. I, p. 499 & pl. XXX, fig. 407, 1903.

On *Tiarella polyphylla* D. Don. (*Dzudayakushu*). Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

5. **Puccinia Campanulae** Carmichael in Berkeley in Smith, Engl. Fl. V (pt. 2), p. 365, 1836.

On *Campanula lasiocarpa* Cham. (*Iwa-gikyô*). Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

6. **Puccinia Funkiae** Dietel in Hedwigia XXXVII, p. 214, 1898.

On *Hosta Sieboldiana* Engl. var. *longipes* Matsum. (*Iwa-giboshi*). July, 1934, K. Ichige; Aug., 1935, K. Togashi & Hiratsuka, f.

7. **Puccinia iwateyamensis** Hiratsuka, f. nov. spec.

Soris uredosporiferis hypophyllis, sparsis, minutis, rotundatis, mox nudis, pulverulentis, cinnamomeo-brunneis; uredosporis subglobosis, obovatis vel ellipsoideis, echinulatis, flavo-brunneis, $21\sim 33 \times 18\sim 28\mu$; episporio $2\sim 3\mu$ crasso. Soris teleutosporiferis hypophyllis, sparsis vel subgregariis, saepe confluentibus, minutissimis, rotundatis, mox nudis, subpulverulentis, atro-brunneis; teleutosporis ellipsoideis vel oblongis, apice rotundatis et semper pallida subhyalina rotundata valde conspicua usque 5μ alta auctis, medio non vel leniter constrictis, basi rotundatis vel vix attenuatis, levibus, brunneis, $36\sim 53 \times 21\sim 27\mu$; episporio $1.5\sim 2\mu$ crasso, poro cellulae inferioris juxta septum posito non vel vix papillato; pedicello hyalino, usque 55μ longo. (Text-fig. 1, b)

On *Pleuropteryum Nakaii* Hara (*Oyama-soba*). Aug. 12, 1898, Naoharu Hiratsuka, type! This fungus closely resembles *Puccinia calumnata* Sydow, from which it distinctly differs in larger teleutospores.

8. **Puccinia Majanthemi** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900.

On *Hosta Sieboldiana* Engl. var. *longipes* Matsum. (*Iwa-giboshi*). Aug., 1935, K. Togashi & Hiratsuka, f.

On *Majanthemum dilatatum* Nels. et Macbr. (*Maidzurusô*). July, 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

9. **Puccinia melanoplaca** Sydow in Ann. Myc. VII, p. 168, 1909.

On *Patrinia gibbosa* Maxim. (*Maruba-kinreikwa*). Aug., 1935, K. Togashi & Hiratsuka, f.

10. **Puccinia Metanarthecii** Patouillard in Rev. Myc. (1886), p. 80, 1886.

On *Aletris foliata* Franch. (*Metanarthecium foliatum* Maxim.) (*Nebari-nogiran*). Aug., 1935, K. Togashi & Hiratsuka, f.

11. **Puccinia nitidula** Tranzschel in Tranzschel et Serebrian., Myc. Ross. exs. nos. 158 & 159, 1911.

On *Pleuropteryum Nakaii* Hara (*Oyama-soba*). Aug. 4, 1935, K. Togashi & Hiratsuka, f.; Sept. 16, 1934, K. Togashi. The present species is a new addition to the mycological flora of Japan. It is closely related to *Puccinia sibirica* Tranzsch., from which it differs in the position of germ pores in the lower cell of the teleutospores, as well as in the shape of uredospores.

12. **Puccinia pachycephala** Dietel in Ann. Myc. IV, p. 305, 1906.

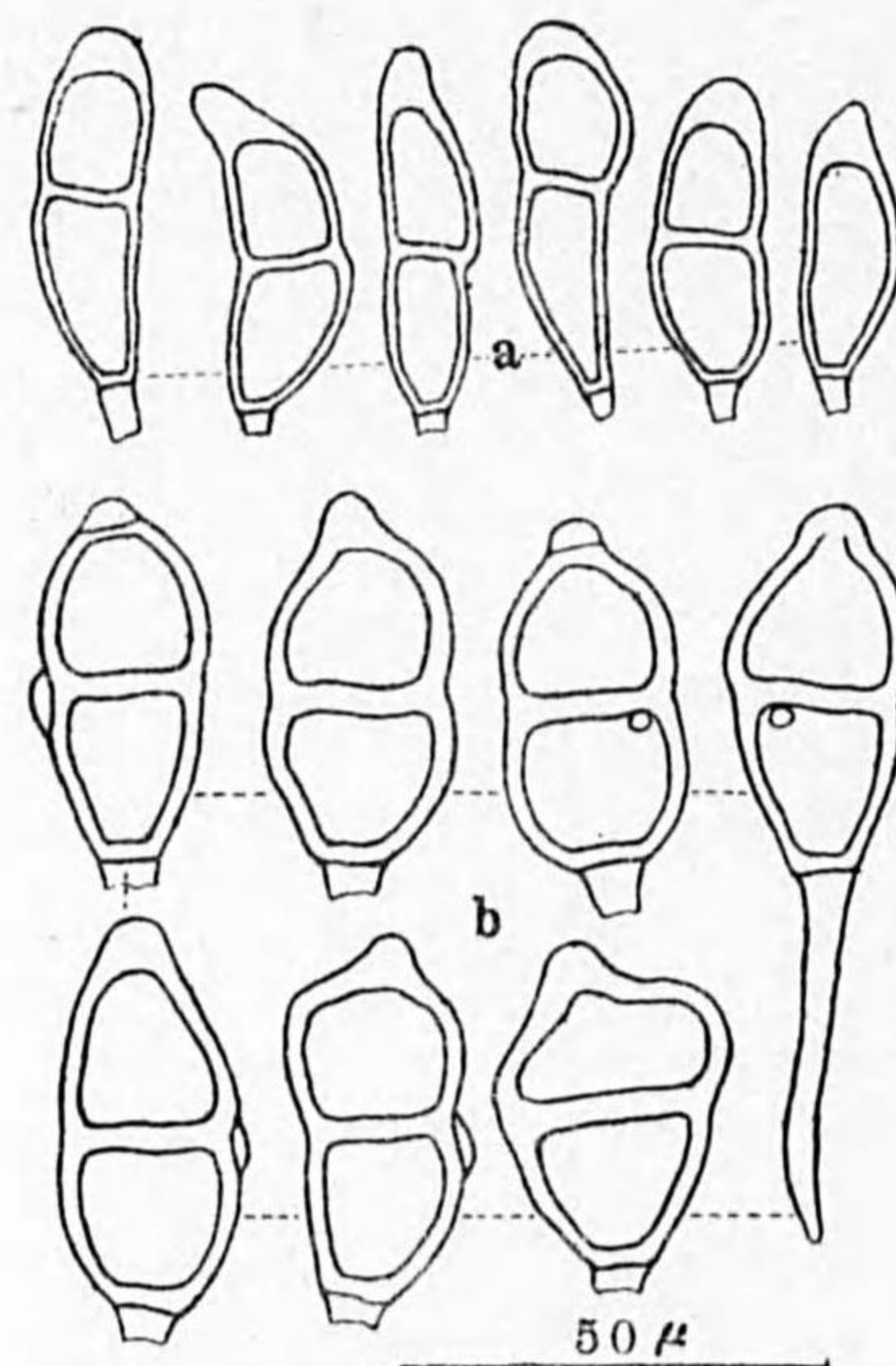
On *Veratrum Maximowiczii* Bak. (*Aoyagisô*). Aug., 1935, K. Togashi & Hiratsuka, f.; Sept., 1916, G. Yamada.

13. **Puccinia Schizocodonis** Patouillard in Bull. Soc. Myc. France, III, p. 124, 1887.

On *Shortia soldanelloides* Mak. var. *genuina* Mak. (*Iwakagami*). Aug., 1908, G. Yamada; Aug., 1935, K. Togashi & Hiratsuka, f.

14. **Puccinia Togashiana** Hiratsuka, f. nov. spec.

Soris teleutosporiferis hypophyllis, minutis, sparsis vel aggregatis, mox nudis, compactis, flavo-brunneis; paraphysibus nullis; teleutosporis fusoides vel cylindraceo-fusoides, apice plerumque attenuatis et valde incrassatis (usque 7μ), medio non vel vix constrictis, basi



Text-fig. 1. a. Teleutospores of *Puccinia Togashiana* Hirats. f. on *Thalictrum tuberiferum*.
b. Teleutospores of *Puccinia iwateyamensis* Hirats. f. on *Pleuropteropyrum Nakaii*.

15. ***Puccinia Trautvetteriae*** Sydow et Holway in Sydow, Monogr. Ured. I, p. 552 & pl. XXXII, fig. 432, 1903.

On *Trautvetteria japonica* Sieb. et Zucc. (*Momijikaramatsu*). Aug., 1908, G. Yamada; July, 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

16. ***Puccinia Violae*** (Schum.) de Candolle in Fl. franç. VI, p. 62, 1815.

On *Viola biflora* L. (*Kibana-no-komanotsume*). Aug., 1935, K. Togashi & Hiratsuka, f.; Sept., 1934, K. Togashi.

17. ***Puccinia Violae-glabellae*** Miura in Sydow in Ann. Myc. XI, p. 101 & text-fig., 1913.

On *Viola brevistipulata* W. Beck. (*Oba-kisumire*). June, 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

attenuatis, levibus, dilute brunneis vel subhyalinis, statim germinantibus, 30~45 × 9~13 μ; episporio ca 1 μ crasso; pedicello persistenti, flavo-brunneo, breviusculo; mesosporis numerosis, fusiformibus, 27~35 × 8~11 μ. (Text-fig. 1, a)

On *Thalictrum tuberiferum* Maxim. (*Miyama-karamatsu*). July 15, 1934, K. Togashi; Aug. 5, 1935, K. Togashi & Hiratsuka, f., *type!*. This species belongs to a microcyclic leptiform. From all species of *Puccinia* on Ranunculaceae belonging to microcyclic form, hitherto known, it distinctly differs in having much smaller teleutospores. The present species is named in honor of Dr. Togashi, who first collected this interesting fungus.

On *Viola crassa* Mak. (*Takane-sumire*). Aug., 1908 & Sept., 1916, G. Yamada; Aug., 1898, Naoharu Hiratsuka; Aug., 1925, M. Tatewaki; July & Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

18. ***Puccinia Virgaureae*** (DC.) Libert, Crypt. Pl. Arduenna, IV, no. 393, 1837.

On *Solidago Virgaurea* L. (*Akinokirinsō*). Aug., 1935, K. Togashi & Hiratsuka, f.

19. ***Xenodochus carbonarius*** Schlechtendal in Linnaea I, p. 237, 1826. Syn. *Phragmidium carbonarium* Winter (Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 43, 1910).

On *Sanguisorba albiflora* Mak. (*Shirobana-tōchisō*). Aug., 1935, K. Togashi & Hiratsuka, f.; Sept., 1916, G. Yamada.

20. ***Gymnosporangium nipponicum*** Yamada, nov. spec.

Soris teleutosporiferis foliicolis, raro in ramis junioribus evolutis, sparsis vel solitariis, minutis, applanatis vel hemisphaericis, pulvinatis, cinnamomeo-brunneis; teleutosporis crasse tunicatis ellipsoideis vel late ellipsoideis, apice et basi plerumque rotundatis, medio 1-septatis, non vel vix constrictis, levibus, castaneo-brunneis, 36~45 × 22~27 μ; episporio 1.5~2.5 μ crasso, quaque cellula poris germinationis 1~2 apicalibus vel prope septum positis praedita; teleutosporis tenuiter tunicatis oblongis vel fusiformibus, apice et basi plus minus attenuatis, medio 1-septatis, plerumque non constrictis, levibus, pallide flavidis vel subhyalinis, 36~55 × 17~21 μ; episporio tenui (1 μ), quaque cellula poris germinationis 2 prope septum positis praedita; pedicello hyalino, cylindraco, longissimo.

On *Juniperus chinensis* L. var. *Sargentii* Henry (*Juniperus Sargentii* Takeda) (*Miyama-byakushin*). June 14, 1919, G. Yamada, *type!*

The present fungus on *Juniperus chinensis* var. *Sargentii* was first collected by K. Sawada at the top of Mt. Hayachine, Rikuchū Province on June 16, 1906. Since then, Dr. Yamada also discovered it on the same plant on Mt. Iwate. Moreover, he proved experimentally that the aecidial stage of this fungus occurs on leaves of *Sorbus Aucuparia* L. The description of the aecidial stage and the results of inoculation experiments with this fungus will be reported in the near future by the writer in a paper, entitled, "*Gymnosporangium* of Japan".

This species closely resembles *Gymnosporangium Haraeae* Syd., whose teleutospores occur on leaves of species of *Juniperus* belonging to the same section, *Sabina*. But, it differs macroscopically from the latter species in having hemispherical or applanate teleutospores, instead of wedge-shaped ones.

21. **Chnoospora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 297, 1927.

On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). Aug., 1935, K. Togashi & Hiratsuka, f.

22. **Melampsorella Caryophyllacearum** Schröter in Hedwigia XIII, p. 85, 1874.

On *Stellaria yezoensis* Maxim. (*Yezo-fusuma*). Aug., 1934, K. Togashi.

23. **Melampsoridium Alni** (Thüm.) Dietel in Engler-Prantl, Natürl. Pflanzenfam. I, 1. Abt. ³, p. 551, 1900.

On *Alnus alnobetula* Hartig var. *fruticosa* Winkl. (*Alnus Maximowiczii* Call., *A. viridis* DC. var. *sibirica* Rgl.) (*Miyama-hannoki*). Sept., 1916, G. Yamada; Sept., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.

24. **Pucciniastrum Pyrolae** (Karst.) Schröter in Jahresber. Schles. Ges. vaterl. Kult. LVIII, p. 167, 1880. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 29, 1927; Bot. Mag. Tokyo, XLVI, p. 266, 1930).

On *Pirola rotundifolia* L. var. *incarnata* DC. (*Benibana-ichiyakusô*). Aug., 1935, K. Togashi & Hiratsuka, f.

25. **Thekopsora Myrtillina** Karsten, Myc. Fenn. IV, p. 59, 1879.

On *Vaccinium axillare* Nakai (*Kurousugo*). Aug., 1935, K. Togashi & Hiratsuka, f.

26. **Thekopsora Tripetaleiae** Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 23, 1927. (Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 18, 1929).

On *Tripetaleia bracteata* Maxim. (*Miyama-hotsutsuji*). Sept., 1916, G. Yamada; Aug., 1935, K. Togashi & Hiratsuka, f.

On *Tripetaleia paniculata* Sieb. et Zucc. (*Hotsutsuji*). Aug., 1897,

Y. Takahashi.

27. **Thekopsora Vacciniorum** Karsten, Myc. Fenn. IV, p. 58, 1879.

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). Aug., 1935, K. Togashi & Hiratsuka, f.

28. **Uredinopsis filicina** (Niessl) Magnus in Atti Congr. Bot. Internat. d. Genova (1892), p. 167 & tab. IX, figs. 1-13, 1893.

On *Dryopteris Phegopteris* C. Chr. (*Miyama-warabi*). Aug., 1935, K. Togashi & Hiratsuka, f.

29. **Chrysomyxa Ledi** De Bary in Bot. Zeitg. XXXVII, p. 809 & tab. X, figs. 7 & 8, 1879.

On *Ledum palustre* L. var. *nipponicum* Nakai (*Isotsutsuji*). Sept., 1911, G. Yamada; Aug., 1935, K. Togashi & Hiratsuka, f.

30. **Coleosporium Ligulariae** Thümen in Bull. Soc. Imp. Nat. Moscou, LII, p. 140, 1877.

On *Ligularia sibirica* Cass. (*O-takarakô*). Sept., 1916, G. Yamada; Sept., 1934, K. Togashi.

31. **Coleosporium Saussureae** Thümen in Bull. Soc. Imp. Nat. Moscou, LV, p. 212, 1880. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 224, 1927).

On *Saussurea sagitta* Franch. (*Yahazu-tôhiren*). Aug., 1934, K. Togashi.

III. Rust-flora in the alpine regions of Yatsugatake mountain range, Shinano Province, Honshû

This mountain range is a volcano group, extending from north to south in the eastern part of Shinano Province, the middle district of Honshû. It consists of more than ten peaks, among which the following six are well known; Aka-dake (2899m), Amigasa-dake (2524m), Nishi-dake (2364m), Gongen-dake (2786m), Amida-ga-dake (2807m), Yoko-dake (2830m) and Iwô-dake (2742m). Aka-dake, the highest peak stands at 36° 2' N. Lat. and 138° 22' E. Long.

In 1922, Ito (52) identified a rust fungus on *Fritillaria camschatensis* Ker. which was collected by T. Miyake in the alpine regions

of this mountain range, with *Uromyces Miurae* Sydow. This is the first record of rust fungus from this mountain range. Since then, the following 31 species of rust fungi have been recorded by the writer in his previous papers (33, 34, 38, 39, 43, 46) from this mountain range. They are:

1. *Uromyces Miurae* Syd.
2. *U. Rudbeckiae* Arth. et Holw.
3. *U. Solidaginis* (Sommerf.) Niessl.
4. *Puccinia asiatica* (Kom.) Syd.
5. *P. ferruginosa* Syd.
6. *P. alpina* Fuck.
7. *P. Haleniae* Arth. et Holw.
8. *P. Majanthemi* Diet.
9. *P. melanoplaca* Syd.
10. *P. porphyrogenita* Curt.
11. *P. Pulsatillae* Kalchbr.
12. *P. Ribis-japonici* P. Henn.
13. *P. Saxifragae* Schlecht.
14. *P. Schizocodonis* Pat.
15. *P. vesiculosa* Schlecht.
16. *P. Viola* (Schum.) DC.
17. *P. vomica* Thüm.
18. *P. Waldsteiniae* Curt.
19. *Tranzschelia fusca* (Pers.) Diet.
20. *Phragmidium alpinum* Hirats. f.
21. *Ph. griseum* Diet.
22. *Ph. Itoanum* Hirats. f.
23. *Triphragmium Thwaitesii* Berk. et Br.
24. *Thekopsora Myrtillina* Karst.
25. *Th. Vacciniorum* Karst.
26. *Calyptospora Goeppertiana* Kühn.
27. *Hyalospora aculeata* Kamei.
28. *Chrysomyxa alpina* Hirats. f.
29. *Ch. Empetri* Schröt.
30. *Ch. expansa* Diet.
31. *Coleosporium Cacaliae* Otth.

The writer's first visit to this mountain range was paid in July 1930 to collect rust fungi. In August 1933, a second visit was carried out for the same purpose. Moreover, an examination was

made of a number of specimens of rust fungi which were collected by G. Yamada and K. Togashi from this range, through their kindness.

In the following, the 26 species of rust fungi found in the alpine regions of this mountain range are listed.

1. **Uromyces Miurae** Sydow in Ann. Myc. XI, p. 94, 1913. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 134, 1934; Bot. & Zool. II, p. 544, 1934; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 260, 1922).

On *Fritillaria camschatensis* Ker. (*Kuroyuri*). Aug., 1903, T. Miyake; July, 1933, Hiratsuka, f.

2. **Uromyces Rudbeckiae** Arthur et Holway in Arthur in Bull. Iowa Agric. Coll. Dept. Bot. (1884), p. 154, 1884. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931; Bot. & Zool. II, p. 544, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). July, 1930, Hiratsuka, f.

3. **Uromyces Solidaginis** (Sommerf.) Niessl in Verh. Nat.-Ver. Brünn, X, p. 163 & pl. III, fig. 10, 1872. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931; Bot. & Zool. II, p. 544, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). July, 1930 & July, 1933, Hiratsuka, f.

4. **Uromyces yatsugatakense** Hiratsuka, f., nov. spec.

Aecidiis hypophyllis vel petiolicolis, in greges orbiculares simplici vel multiplici serie dispositis, minutis, breviter cylindraceis, 0.2~0.3 mm diam., margine albo; cellulis contextus e facie visis oblongo-fusiformibus, 30~50 × 15~24 μ ; pariete exteriore-levi, interiore papillis elongatis irregularibus variae longitudinis densiuscule obsito, parietibus lateralibus aequae ac interiore rugosis; aecidiosporis globosis, subglobosis vel late ellipsoideis, subtiliter verruculosus, flavidis, 17~22 × 14~20 μ ; episporio 1~1.2 μ crasso.

Soris uredosporiferis epiphyllis, rarius hypophyllis, sparsis, minutis, rotundatis, ellipsoideis vel oblongis, 0.12~0.24 mm diam., pulverulentis, flavo-brunneis; uredosporis globosis, subglobosis vel ellipsoideis, dense echinulatis, pallide flavidis, 22~27 × 18~24 μ ; episporio 1.2~2 μ crasso.

Soris teleutosporiferis plerumque epiphyllis, sparsis vel solitariis, minutis, rotundatis vel oblongis, 0.14~0.4 mm diam., epidermide diu tectis, dein nudis, subpulverulentis, atro-brunneis; teleutosporis ovatis, ellipsoideis vel oblongis, apice papillula majuscula prominula subhyalina instructis, dense verruculosus, brunneis, 24~28 x 14~20 μ ; episporio 2~2.5 μ crasso; pedicello hyalino, brevi.

On *Hedysarum elongatum* Fisch. var. *albiflorum* Ledeb. (*Hedysarum esculentum* Ledeb.) (*Iwa-ôgi*). July 20, 22 & 23 (*type!*), 1930, Hiratsuka, f. This species is closely related to *Uromyces Hedysari-obscuri* (DC.) Carest. et Picc., but it can be distinguished from the latter species in having uredo-generation in its life-cycle.

5. ***Puccinia alpina*** Fuckel, Symb. Myc. Nachtr. II, p. 13, 1873. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 1, 1934; Bot. & Zool. II, p. 544, 1934).

On *Viola biflora* L. (*Kibana-no-komanotsume*). July, 1933, Hiratsuka, f.

6. ***Puccinia Circaeae*** Persoon in Neues Mag. Bot. I, p. 119, 1794; Syn. Fung. p. 228, 1801.

On *Circaea alpina* L. (*Miyama-tanitate*). July, 1933, Hiratsuka, f.

7. ***Puccinia Majanthemi*** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 544, 1934).

On *Disporum smilacinum* Gray (*Chigoyuri*). Aug., 1926, G. Yamada.

On *Majanthemum dilatatum* Nels. et. Macbr. (*Maidzurusô*). July, 1930 & July, 1933, Hiratsuka, f.

8. ***Puccinia melanoplaca*** Sydow in Ann. Myc. VII, p. 168, 1909. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931; Bot. & Zool. II, p. 544, 1934).

On *Patrinia triloba* Matsum. (*Hakusan-ominaeshi*). July, 1930, Hiratsuka, f.

9. ***Puccinia porphyrogenita*** Curtis in Thümen, Myc. univ. no. 545, 1876. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931; Bot. & Zool. II, p. 544, 1934).

On *Chamaepericlymenum canadense* Achers. et Graebn. (*Gozen-tachibana*). Aug., 1926, G. Yamada; July, 1930 & July, 1933, Hiratsuka, f.

ka, f.

10. ***Puccinia Pulsatillae*** Kalchbrenner in Mathem. es termes-zett. Közkemenyek III, p. 307, 1865. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 544, 1934).

On *Pulsatilla nipponica* Ohwi (*Anemone patens* L. var. *intermedia* Mak., *Pulsatilla angustifolia* Turcz. var. *japonica* Takeda) (*Tsukumogusa*). Aug., 1926, G. Yamada; July, 1930, Hiratsuka, f.

11. ***Puccinia Ribis-japonici*** Hennings in Hedwigia XLI, p. (19), 1902. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 544, 1934).

On *Ribes japonicum* Maxim. (*Komagatake-suguri*). July, 1933, Hiratsuka, f.

12. ***Puccinia Saxifragae*** Schlechtendal, Fl. Berol. II, p. 134, 1824. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Saxifraga fusca* Maxim. (*Kuro-kumosô*). July, 1930 & July, 1933, Hiratsuka, f.

13. ***Puccinia Schizocodonis*** Patouillard in Bull. Soc. Myc. Fr. III, p. 124, 1887. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931; Bot. & Zool. II, p. 544, 1934).

On *Shortia soldanelloides* Mak. var. *genuina* Mak. (*Iwa-kagami*). July, 1930 & July, 1933, Hiratsuka, f.

14. ***Puccinia vesiculosa*** Schlechtendal in Ehrenb., Fung. Cha-miss. p. 97, 1820. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 544, 1934).

On *Anemone narcissiflora* L. (*Hakusan-ichige*). Aug., 1926, G. Yamada; July, 1930 & July, 1933, Hiratsuka, f.

15. ***Puccinia Violae*** (Schum.) de Candolle in Fl. franç. VI, p. 62, 1815. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Viola biflora* L. (*Kibana-no-komanotsume*). July, 1933, Hiratsuka, f.

16. ***Puccinia vomica*** Thümen in Bull. Soc. Imp. Nat. Moscou, LV, p. 209, 1880. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 1931).

On *Saussurea kai-montana* Takeda form. *major* Takeda (*Miyama-higotai*). July, 1930, Hiratsuka, f.

17. **Phragmidium alpinum** Hiratsuka, f. in Ann. Myc. XXVIII, p. 280, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 544, 1934; Jap. Jour. Bot. VII, p. 244, 1935).

On *Rubus pedatus* Sm. (*Kogane-ichigo*). Aug., 1926, G. Yamada; July, 1930, Hiratsuka, f.

18. **Phragmidium Itoanum** Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. XIII, p. 134, 1934. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934; Jap. Jour. Bot. VII, p. 271, 1935).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). July, 1930, Hiratsuka, f.

19. **Chnoopsora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 297, 1927.

On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). July, 1930, Hiratsuka, f.

20. **Thekopsora Myrtilina** Karsten, Myc. Fenn. IV, p. 59, 1879. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Vaccinium axillare* Nakai (*Kuro-usugo*). July, 1933, Hiratsuka, f.

21. **Thekopsora Vacciniorum** Karsten, Myc. Fenn. IV, p. 58, 1879. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). July, 1930 & July, 1933, Hiratsuka, f.

22. **Calyptospora Goepfertiana** Kühn in Hedwigia VIII, p. 81, 1869. (Hiratsuka, f. in Jour. Jap. Bot. IX, p. 277, 1933; Bot. & Zool. II, p. 544, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). July, 1933, Hiratsuka, f.

23. **Chrysomyxa alpina** Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 471, 1929. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Rhododendron chrysanthum* Pall. (*Kibana-shakunage*). July, 1925, K. Togashi.

24. **Chrysomyxa Empetri** Schröter in Krypt. Fl. Schles. III,

1, p. 372, 1887. (Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 475, 1929; Bot. & Zool. II, p. 544, 1934).

On *Empetrum nigrum* L. (*Gankōran*). Aug., 1926, G. Yamada; July, 1933, Hiratsuka, f.

25. **Chrysomyxa expansa** Dietel in Engl. Bot. Jahrb. XXVIII, p. 287, 1900. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Rhododendron Fauriae* Franch. (*Usuki-shakunage*). July, 1930 & July, 1933, Hiratsuka, f.

26. **Coleosporium Cacaliae** Otth in Mitteil. Naturf. Ges. Bern (1865), p. 179, 1866. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Cacalia adenostyloides* Franch. et Sav. (*Kani-kōmori*). July, 1930 & July, 1933, Hiratsuka, f.

IV. Rust-flora in the alpine regions of Mt. Tsubakuro-dake, Shinano Province, Honshū

Mt. Tsubakuro-dake is entirely of palaeozoic formation. It is one of the famous mountains in the middle district of Honshū, towering to a height of 2763.4 meters in the Jōnen mountain range, a part of the so-called "North Japan Alps". It is so situated that the meridian of 137°43' East of Greenwich, and the parallel of 36°24' North intersect near its summit.

In 1931, the writer (34) recorded the following 20 microcyclic species of rust fungi from this mountain. They are:

1. *Uromyces Rudbeckiae* Arth. et Holw.
2. *U. Solidaginis* (Sommerf.) Niessl.
3. *Puccinia alpina* Fuck.
4. *P. asiatica* (Kom.) Syd.
5. *P. asarina* Kunze.
6. *P. Adenophorae* Diet.
7. *P. Circaeae* Pers.
8. *P. cuneata* Diet.
9. *P. exhausta* Diet.
10. *P. hakkodensis* Hirats. f.
11. *P. Majanthemi* Diet.
12. *P. melanoplaca* Syd.
13. *P. porphyrogenita* Curt.

14. *P. Schizocodonis* Pat.
15. *P. Schizonepetae* Tranzsch.
16. *P. Saxifragae* Schlecht.
17. *P. Trautvetteriae* Syd. et Holw.
18. *P. vesiculosa* Schlecht.
19. *Phragmidium alpinum* Hirats. f.
20. *Ph. Miyabeanum* Ito et Hirats. f.

Since then, the writer (38, 43, 46) also reported the following 12 species from the same mountain. They are:

1. *Uromyces japonicus* Berk. et Curt.
2. *U. Veratri* (DC.) Schröt.
3. *Puccinia Bistortae* DC.
4. *P. calumnata* Syd.
5. *P. Hieracii* (Schum.) Mart.
6. *P. Violae-glabellae* Miura.
7. *Phragmidium Itoanum* Hirats. f.
8. *Thekopsora Vacciniorum* Karst.
9. *Calyptospora Goepfertiana* Kühn.
10. *Hyalospora aculeata* Kamei.
11. *Chrysomyxa Empetri* Schröt.
12. *Cronartium kamschaticum* Jørstad.

Therefore, the total number of species which have been hitherto recorded therefrom is 32.

In the summer of 1930, the writer spent about ten days in this mountain for the purpose of fungus collection, when he gathered about 160 species of parasitic fungi including fifty or more species of rust fungi. The following list is an enumeration of species of rust fungi found in the alpine regions of Mt. Tsubakuro-dake.

1. ***Uromyces japonicus*** Berkeley et Curtis in Proc. Amer. Acad. Arts & Sci. IV, p. 126, 1858. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 134, 1934).

On *Allium Victorialis* L. (*Gyōjya-ninniku*). July, 1930, Hiratsuka, f.

2. ***Uromyces Rudbeckiae*** Arthur et Holway in Arthur in Bull. Iowa Agric. Coll. Dept. (1884), p. 154, 1884. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsō*). July & Aug., 1930, Hira-

[Memoirs Tottori Agric. College

tsuka, f.

3. ***Uromyces Solidaginis*** (Sommerf.) Niessl in Verh. Nat.-Ver. Brünn, X, p. 163 & pl. III, fig. 10, 1872. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsō*). Aug., 1930, Hiratsuka, f.

4. ***Uromyces Veratri*** (DC.) Schröter in Abh. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLVIII, (1869~72), p. 10, 1870. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Veratrum album* L. var. *grandiflorum* Maxim. (*Baikeisō*). July, 1930, Hiratsuka, f.

5. ***Uromyces yatsugatakense*** Hiratsuka, f., l. c. p. 147.

On *Hedysarum elongatum* Fisch. var. *albiflorum* Ledeb. (*Iwa-ōgi*). July, 1930, Hiratsuka, f.

6. ***Puccinia alpina*** Fuckel, Symb. Myc. Nachtr. II, p. 13, 1873. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Jour. Jap. Bot. X, p. 1, 1934; Bot. & Zool. II, p. 545, 1934).

On *Viola biflora* L. (*Kibana-no-komanotsume*). Aug., 1930, Hiratsuka, f.

On *Viola vaginata* L. (*Sumire-saishin*). Aug., 1930, Hiratsuka, f.

7. ***Puccinia Bistortae*** de Candolle in Fl. franç. VI, p. 61, 1815. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Bistorta vivipara* S. F. Gray (*Polygonum viviparum* L.) (*Mukago-toranoō*). Aug., 1930, Hiratsuka, f.

8. ***Puccinia calumnata*** Sydow in Ann. Myc. XI, p. 102, 1913. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Pleuropterypyrum Weyrichii* H. Gross. var. *alpicolum* Koidz. (*Takane-urajiro-tade*). Aug., 1930, Hiratsuka, f.

9. ***Puccinia Circaeae*** Persoon in Neues Mag. Bot. I, p. 119, 1797; Syn. Fung. p. 228, 1801. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).

On *Circaea alpina* L. (*Miyama-tanitade*). July, 1930, Hiratsuka, f.

10. ***Puccinia cuneata*** Dietel in Ann. Myc. IV, p. 304, 1906. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931;

Vol. III, No. 2, 1935)

- Bot. & Zool. II, p. 545, 1934).
 On *Geranium yesoense* Franch. et Sav. var. *nipponicum* Nakai (*Hakusan-fûro*). Aug., 1930, Hiratsuka, f.
11. **Puccinia ferruginosa** Sydow, Monogr. Ured. I, p. 13 & pl. I, fig. 10, 1902.
 On *Artemisia vulgaris* L. var. *integrifolia* Ledeb. (*Hitotsuba-yomogi*). Aug., 1930, Hiratsuka, f.
12. **Puccinia Hieracii** (Schum.) Martius, Fl. Mosq. II. ed., p. 226, 1812. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).
 On *Hieracium japonicum* Franch. et Sav. (*Miyama-kôzorina*). Aug., 1930, Hiratsuka, f.
13. **Puccinia Lactucae** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).
 On *Lactuca alpicola* Nakai (*Ixeris alpicola* Nakai) (*Takane-nigana*). Aug., 1930, Hiratsuka, f.
14. **Puccinia Majanthemi** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 220, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Disporum smilacinum* Gray (*Chigo-yuri*). July, 1930, Hiratsuka, f.
 On *Majanthemum dilatatum* Nels. et Macbr. (*Maidzurusô*). July & Aug., 1930, Hiratsuka, f.
15. **Puccinia melanoplaca** Sydow in Ann. Myc. VII, p. 168, 1909. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Patrinia triloba* Matsum. (*Hakusan-ominaeshi*). July, 1930, Hiratsuka, f.
16. **Puccinia Polygoni-Weyrichii** T. Miyake in Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 234 & fig. 1, 1931.
 On *Pleuropteryum Weyrichii* H. Gross. var. *alpicolum* Koidz. (*Takane-urajiro-tade*). July, 1930, Hiratsuka, f.
17. **Puccinia porphyrogenita** Curtis in Thümen, Myc. univ. no. 545, 1876. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Chamaepericlymenum canadense* Aschers. et Graebn. (*Gozen-ta-*

- chibana*). Aug., 1930, Hiratsuka, f.
18. **Puccinia Saxifragae** Schlechtendal, Fl. Berol. II, p. 134, 1824. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Saxifraga fusca* Maxim. (*Kurokumosô*). July & Aug., 1930, Hiratsuka, f.
19. **Puccinia Schizocodonis** Patouillard in Bull. Soc. Myc. France, III, p. 124, 1887. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Shortia soldanelloides* Mak. var. *genuina* Mak. (*Iwa-kagami*). Aug., 1930, Hiratsuka, f.
20. **Puccinia Trautvetteriae** Sydow et Holway in Sydow, Monogr. Ured. I, p. 552 & pl. XXXII, fig. 432, 1904. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 220, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Trautvetteria japonica* Sieb. et Zucc. (*Momiji-karamatsu*). July & Aug., 1930, Hiratsuka, f.
21. **Puccinia vesiculosa** Schlechtendal in Ehrenb., Fung. Chamiss., p. 97, 1820. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 220, 1931; Bot. & Zool. II, p. 545, 1934).
 On *Anemone narcissiflora* L. (*Hakusan-ichige*). Aug., 1930, Hiratsuka, f.
22. **Puccinia Violae** (Schum.) de Candolle in Fl. franç. VI, p. 62, 1812.
 On *Viola biflora* L. (*Kibana-no-komanotsume*). July, 1930, Hiratsuka, f.
23. **Puccinia Violae-glabellae** Miura in Sydow in Ann. Myc. XI, p. 101 & text-fig., 1913. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).
 On *Viola brevistipulata* W. Beck. (*Oba-kisumire*). July, 1930, Hiratsuka, f.
24. **Phragmidium alpinum** Hiratsuka, f. in Ann. Myc. XXVIII, p. 280, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 220, 1931; Bot. & Zool. II, p. 545, 1934; Jap. Jour. Bot. VII, p. 244 & pl. III, fig. 2, 1935).

On *Rubus pedatus* Sm. (*Kogane-ichigo*). July & Aug., 1930, Hiratsuka, f.

25. **Phragmidium Itoanum** Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. XIII, p. 134, 1934. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934; Jap. Jour. Bot. VII, p. 271, 1935).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). July & Aug., 1930, Hiratsuka, f.

26. **Phragmidium Miyabeanum** Ito et Hiratsuka, f. in Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 220, 1931; Bot. & Zool. II, p. 545, 1934; Jap. Jour. Bot. VII, p. 259, 1935).

On *Sieversia pentapetala* Greene (*Chinguruma*). July & Aug., 1930, Hiratsuka, f.

27. **Melampsora Kusanoi** Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905.

On *Hypericum kamtschaticum* Ledeb. (*Iwa-otogiri*). July & Aug., 1930, Hiratsuka, f.

28. **Chnoospora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 297, 1927.

On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). July & Aug., 1930, Hiratsuka, f.

29. **Thekopsora Vacciniorum** Karsten, Myc. Fenn. IV, p. 58, 1878. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). July, 1930, Hiratsuka, f.

30. **Calyptospora Goeppertiana** Kühn in Hedwigia VIII, p. 81, 1869. (Hiratsuka, f. in Jour. Jap. Bot. IX, p. 277, 1933).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). July, 1930, Hiratsuka, f.

31. **Chrysomyxa Empetri** Schröter in Krypt. Fl. Schles. III, 1, p. 372, 1887. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Empetrum nigrum* L. (*Gankōran*). Aug., 1930, Hiratsuka, f.

32. **Cronartium kamtschaticum** Jørstad in Skrift. utgitt av Det Norske Videnskaps-Akad. i Oslo I. Matem.-Nat. Klasse, no. 9

(1933), p. 27, 1934. Syn. *Cronartium Pedicularis* (not Lindr.) (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934).

On *Pedicularis yezoensis* Maxim. (*Yezo-shiogama*). Aug., 1930, Hiratsuka, f.

V. Rust-flora in the alpine regions of Mt. Komagatake (Kiso), Shinano Province, Honshū

This mountain, known among mountaineers by the name of "Kiso-Koma" or "Nishi-Koma" is a cluster of several peaks in a part of the Kiso mountain range (often called "Chūwō-Alps") which stretches in the south-eastern part of Shinano Province. It is of palaeozoic formation, consisting of about ten peaks. The highest one of the cluster, Hon-dake lies in the latitude 35°47' north and in the longitude 137°48' east, and attains a height of 2956 meters. Besides Hon-dake, the following six peaks have long been well known; Hōken-dake (2933 m), Ina-Mae-dake (2900 m), Sannosawa-dake (2846.5 m), Mae-dake (2826 m), Shōgigashira (2727 m) and Chausu-yama (2652.7 m). In 1932, the writer and Uemura (50) recorded that *Hyalopsora Polypodii* (Diet.) P. Magn. on *Athyrium Filix-foemina* Roth. var. *nigropalaeaceum* Mak. had been collected by the senior writer in this mountain. This is the first record of rust fungi from it. Since then, the writer (39, 43, 46) has also recorded from this mountain thirty species, as follows:-

1. *Uromyces Miurae* Syd.
2. *U. Rudbeckiae* Arth. et Holw.
3. *U. Solidaginis* (Sommerf.) Niessl.
4. *U. Veratri* (DC.) Schröt.
5. *Puccinia alpina* Fuck.
6. *P. calumnata* Syd.
7. *P. Circaeae* Pers.
8. *P. Hieracii* (Schum.) Mart.
9. *P. Lactucae* Diet.
10. *P. Majanthemi* Diet.
11. *P. melanoplaca* Syd.
12. *P. porphyrogenita* Curt.
13. *P. Saxifragae* Schlecht.
14. *P. Schizocodonis* Pat.
15. *P. Trautvetteriae* Syd. et. Holw.
16. *P. vesiculosa* Schlecht.

17. *P. Violae* (Schum.) DC.
18. *Phragmidium alpinum* Hirats. f.
19. *Ph. Itoanum* Hirats. f.
20. *Ph. Miyabeanum* Ito et Hirats. f.
21. *Thekopsora Myrtillina* Karst.
22. *Th. sparsa* (Wint.) P. Magn.
23. *Th. Tripetaleiae* Hirats. f.
24. *Th. Vacciniorum* Karst.
25. *Calyptospora Goeppertiana* Kühn.
26. *Chrysomyxa Empetri* Schröt.
27. *Ch. expansa* Diet.
28. *Cronartium kamtschaticum* Jørstad.
29. *Coleosporium Cacaliae* Oth.
30. *C. Saussureae* Thüm.

In August 1931, the writer first visited this mountain for the purpose of collection of rust fungi. A second visit was undertaken for the same purpose in August of the next year. During these two excursions more than 80 species of rust fungi were collected. Among these fungi, the following 34 species which were found in the alpine regions are included.

1. **Uromyces Miurae** Sydow in Ann. Myc. XI, p. 94, 1913. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 134, 1934; Bot. & Zool. II, p. 543, 1934).

On *Fritillaria camtschaticensis* Ker. (*Kuro-yuri*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

2. **Uromyces Rudbeckiae** Arthur et Holway in Arthur in Bull. Iowa Agric. Coll. Dept. Bot. (1884), p. 154, 1884. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). Aug., 1931, Hiratsuka, f.

3. **Uromyces Solidaginis** (Sommerf.) Niessl in Verh. Nat.-Ver. Brünn, X, p. 163 & pl. III, fig. 10, 1872. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

4. **Uromyces Veratri** (DC.) Schröter in Abh. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLIII (1869~72), p. 10, 1870. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Veratrum album* L. var. *grandiflorum* Maxim. (*Baikeisô*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

5. **Puccinia alpina** Fuckel, Symb. Myc. Nachtr. II, p. 13, 1873. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 1, 1934; Bot. & Zool. II, p. 543, 1943).

On *Viola biflora* L. (*Kibana-no-komanotsume*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

6. **Puccinia calumnata** Sydow in Ann. Myc. XI, p. 102, 1913. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1943).

On *Pleuropterypyrum Savatieri* Koidz. (*Polygonum Savatieri* Nakai) (*Iwa-tade*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

7. **Puccinia Circaeae** Persoon in Neues Mag. Bot. I, p. 119, 1794; Syn. Fung. p. 228, 1801. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Circaea alpina* L. (*Miyama-tanitade*). Aug., 1931, Hiratsuka, f.

8. **Puccinia Hieracii** (Schum.) Martius, Fl. Mosq. II. ed., p. 226, 1812. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Hieracium japonicum* Franch. et Sav. (*Miyama-kôzorina*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

9. **Puccinia Lactucae** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Lactuca alpicola* Nakai (*Takane-nigana*). Aug., 1931, Hiratsuka, f.

10. **Puccinia Majanthemi** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Majanthemum dilatatum* Nels. et Macbr. (*Maidzurusô*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

11. **Puccinia melanoplaca** Sydow in Ann. Myc. VII, p. 168, 1909. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Patrinia triloba* Matsum. (*Hakusan-ominaeshi*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

12. **Puccinia Nanbuana** Hennings in Hedwigia XL, p. (26), 1901.

On *Peucedanum multivittatum* Maxim. (*Hakusan-bôfû*). Aug., 1931,

Hiratsuka, f.

13. **Puccinia porphyrogenita** Curtis in Thümen, Myc. univ. no. 545, 1876. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Chamaepericlymenum canadense* Aschers. et Graebn. (*Gozen-tachibana*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

14. **Puccinia Saxifragae** Schlechtendal, Fl. Berol. II, p. 134, 1824. (Hiratsuka, f. in Bot. & Zool. II, p. 543, 1934).

On *Saxifraga cortusaefolia* Sieb. et Zucc. var. *typica* Mak. (*Daimon-jisô*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

On *Saxifraga fusca* Maxim. (*Kurokumosô*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

15. **Puccinia Schizocodonis** Patouillard in Bull. Soc. Myc. Fr. III, p. 124, 1887. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Shortia soldanelloides* Mak. var. *genuina* Mak. (*Iwa-kagami*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

16. **Puccinia Trautvetteriae** Sydow et Holway in Sydow, Monogr. Ured. I, p. 552 & pl. XXXII, fig. 432, 1904. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 222, 1934; Bot. & Zool. II, p. 544, 1934).

On *Trautvetteria japonica* Sieb. et Zucc. (*Momijikaramatsu*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

17. **Puccinia vesiculosa** Schlechtendal in Ehrenb., Fung. Cha-miss. p. 97, 1820. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Anemone narcissiflora* L. (*Hakusan-ichige*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

18. **Puccinia Violae** (Schum.) de Candolle in Fl. franç. VI, p. 62, 1815. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Viola biflora* L. (*Kibana-no-komanotsume*). Aug., 1932, Hiratsuka, f.

19. **Phragmidium alpinum** Hiratsuka, f. in Ann. Myc. XXVIII, p. 280, 1930. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934; Jap. Jour. Bot. VII, p. 244, 1935).

On *Rubus pedatus* Sm. (*Kogane-ichigo*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

20. **Phragmidium Itoanum** Hiratsuka, f. in Transact. Sapporo

[Memoirs Tottori Agric. College

Nat. Hist. Soc. XIII, p. 134, 1934. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934; Jap. Jour. Bot. VII, p. 271, 1935).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

21. **Phragmidium Miyabeanum** Ito et Hiratsuka, f. in Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934; Jap. Jour. Bot. VII, p. 259, 1935).

On *Sieversia pentapetala* Greene (*Chinguruma*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

22. **Melampsora Kusanoi** Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905.

On *Hypericum kamtschaticum* Ledeb. (*Iwa-otogiri*). Aug., 1932, Hiratsuka, f.

23. **Melampsorella Caryophyllacearum** Schröter in Hedwigia XIII, p. 85, 1874.

On *Cerastium schizopetalum* Maxim. (*Miyama-miminagusa*). Aug., 1931, Hiratsuka, f.

On *Stellaria florida* Fisch. var. *angustifolia* Maxim. (*Iwa-tsumekusa*). Aug., 1932, Hiratsuka, f.

24. **Thekopsora Myrtillina** Karsten, Myc. Fenn. IV, p. 59, 1879. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Vaccinium axillare* Nakai (*Kuro-usugo*). Aug., 1932, Hiratsuka, f.

On *Vaccinium uliginosum* L. (*Kuromame-no-ki*). Aug., 1932, Hiratsuka, f.

25. **Thekopsora sparsa** (Wint.) Magnus in Dalla Torre & Sarnth., Fl. Tirol, III, p. 118, 1905. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Arctous japonicus* Nakai (*Kuma-kokemomo*). Aug., 1931, Hiratsuka, f.

26. **Thekopsora Tripetaleiae** Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 23, 1927. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Tripetaleia bracteata* Maxim. (*Miyama-hotsutsuji*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

Vol. III, No. 2, 1935]



27. **Thekopsora Vacciniorum** Karsten, Myc. Fenn. IV, p. 58, 1879. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

28. **Calyptospora Goepfertiana** Kühn in Hedwigia VIII, p. 81, 1869. (Hiratsuka, f. in Jour. Jap. Bot. IX, p. 276 & text-fig. 3, 1933; Bot. & Zool. II, p. 544, 1934).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

29. **Hyalopsora Polypodii** (Diet.) Magnus in Ber. Deutsch. Bot. Ges. XIX, p. 582, 1901. (Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 71, 1932).

On *Athyrium Filix-foemina* Roth. var. *nigropaleaceum* Mak. (*Miyamameshida*). Aug., 1932, Hiratsuka, f.

30. **Chrysomyxa Empetri** Schröter in Krypt. Fl. Schles. III, 1, p. 372, 1887. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Empetrum nigrum* L. (*Gankōran*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

31. **Chrysomyxa expansa** Dietel in Engl. Bot. Jahrb. XXVIII, p. 287, 1900. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Rhododendron Fauriae* Franch. (*Usuki-shakunage*). Aug., 1931, Hiratsuka, f.

32. **Cronartium kamschaticum** Jørstad in Skrift. utgitt av Det Norske Videnskaps-Akad. i Oslo I. Matem.-Nat. Klasse, no. 9 (1933), p. 27, 1934. Syn. *Cronartium Pedicularis* (not Lindr.) (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Pedicularis resupinata* L. (*Yezo-shiogama*). Aug., 1932, Hiratsuka, f.

33. **Coleosporium Cacaliae** Otth in Mitteil. Naturf. Ges. Bern (1865), p. 179, 1866. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Cacalia adenostylloides* Franch. et Sav. (*Kani-kōmori*). Aug., 1931 & Aug., 1932, Hiratsuka, f.

34. **Coleosporium Saussureae** Thümen in Bull. Soc. Imp. Nat. Moscou, LV, p. 212, 1880. (Hiratsuka, f. in Bot. & Zool. II, p. 544, 1934).

On *Saussurea* sp. Aug., 1932, Hiratsuka, f.

VI. Species of rust fungi found in the alpine regions of other mountains in Japan

In addition to the 69 species of rust fungi found in the alpine regions of the five mountains as enumerated above, a number have been found in similar regions of other mountains in South Saghalien, Hokkaidō and Honshū, such as; Mt. Tosso (*S. Saghalien*), Mt. Rishiri (*Hokkaidō*), Akan Mts. (*Hokkaidō*), Hakkōda Mts. (*Honshū*), Mt. Yakeishi-dake (*Honshū*), Mt. Hayachine (*Honshū*), Mt. Shirane (*Nikkō*) (*Honshū*) and others. The following list is an enumeration of these species.

1. **Uromyces amoenus** Sydow in Ann. Myc. IV, p. 28, 1906. (Hara in Shidzuoka-ken-nōkai-hō, XXXIV, no. 10, p. 56, text-fig. 3, 1930).

On *Anaphalis alpicola* Mak. (*Takane-usuyukisō*). *Honshū*:- Prov. Suruga: Mt. Akaishi (Aug., 1930, K. Hara).

2. **Uromyces Geranii** (DC.) Fries, Sum. Veg. Scand. p. 514, 1849. (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 65, 1930).

On *Geranium erianthum* DC. (*Chishima-jūro*). *S. Saghalien*:- Mt. Tosso (July, 1927, Hiratsuka, f.).

3. **Uromyces Hedysari-obscuri** (DC.) Carestia et Piccone, Erb. Critt. Ital. II, no. 447, 1871. (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 64, 1930).

On *Hedysarum obscurum* L. var. *neglectum* Trautv. (*Chishima-geenge*). *S. Saghalien*:- Mt. Tosso (July, 1927, Hiratsuka, f.); Mt. Kashipo (Aug., 1928, Hiratsuka, f.).

4. **Uromyces Peracarpae** Ito et Tochinai in Ito in Bot. Mag. Tokyo, XL, p. 278 & fig. 1, A, 1926. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Mem. Tottori Agric. Coll. I, p. 64, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215 & 230, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 162, 1930).

On *Peracarpa carnosa* Hook. f. et Thoms. (*Tani-gikyō*). *S. Saghalien*:- Mt. Tosso (July, 1927, Hiratsuka, f.). *Hokkaidō*:- Prov. Kitami: Mt. Rishiri (July, 1930, M. Terui). Prov. Kushiro: Mt. Meakan-dake (Sept., 1925, Hiratsuka, f.).

5. **Puccinia Fergussoni** Berkeley et Broome in Ann. Nat. Hist. (IV), XV, p. 35, 1875. (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 70, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 217 & 237, 1931; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 264, 1927).

On *Viola Selkirkii* Pursh. (*Miyama-sumire*). *S. Saghalien*:- Mt. Kashiho (Aug., 1928, Hiratsuka, f.). *Honshû*:- Prov. Mutsu: Mt. Hakkôda (Sept., 1926, S. Ito & Hiratsuka, f.).

6. **Puccinia Gymnandrae** Tranzschel in Script. Bot. Hort. Univ. Imp. Peteropol. III, p. 137, 1891. (Hara in Jour. Jap. Hort. Soc. XXVIII, no. 7, p. 8 & text-fig., 1916).

On *Lagotis glauca* Gaertn. (*Uruppu-sô*). *Honshû*:- Prov. Shinano: Mt. Shirouma-dake (K. Onuma).

7. **Puccinia melasmoides** Tranzschel in Sydow, Monogr. Ured. I, p. 538, 1904. (Ito in Miyabe-Festschrift, p. (60), 1911).

On *Aquilegia akitensis* Huth. (*Miyama-odamaki*). *Honshû*:- Prov. Shinano: Mt. Shirouma-dake (Aug., 1906, M. Miura).

8. **Puccinia rhytismoides** Johanson in Bot. Not. (1886), p. 173, 1886; Bot. Centralbl. XXVIII, p. 394, 1886. (Ito in Miyabe-Festschrift, p. (64), 1911).

On *Thalictrum alpinum* L. (*Hime-karamatsu*). *Honshû*:- Prov. Shinano: Mt. Shirouma-dake (Aug., 1906, M. Miura).

On *Thalictrum tuberiferum* Maxim. (*Miyama-karamatsu*). *Honshû*:- Prov. Echigo: Mt. Ninôji (Aug., 1910, S. Ito).

9. **Puccinia sibirica** Tranzschel in Tranzschel et Serebrian., Myc. Ross. no. 160, 1910. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 238, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 161, 1930).

On *Pleuropteropyrum ajanense* Nakai var. *glabrescens* Miyabe (*Chishima-hime-iwatade*) (*Polygonum polymorphum* Ledeb. var. *ajanense* Rgl. et Til. form. *glabrescens* Takeda). *S. Saghalien*:- Mt. Tosso (July, 1927, Hiratsuka, f., M. Nagai & S. Nakagawa).

On *Pleuropteropyrum ajanense* Nakai var. *pilosum* Miyabe (*Polygonum polymorphum* var. *ajanense* form. *pilosum* Takeda) (*Hosoba-ontade*). *Hokkaidô*:- Prov. Kitami: Momoiwa (Rebun).

10. **Puccinia Tokunagai** Ito et Kawai in Kawai & Otani in

Transact. Sapporo Nat. Hist. Soc. XI, p. 236 & fig. 3, 1931. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 236, 1931).

On *Leontopodium sachalinense* Miyabe et Kudo (*Leontopodium japonicum* Miq. subsp. *sachalinense* Takeda) (*Yezo-usuyukisô*). *S. Saghalien*:- Mt. Tosso (Sept., 1929, Y. Tokunaga & K. Kawai, type!).

11. **Phragmidium fusiforme** Schröter, in Abh. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLVIII (1869~72), p. 24, 1872. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 250, 1935).

On *Rosa acicularis* Lindl. var. *Gmelini* C. K. Schneid. (*Ô-takane-bara*). *Hokkaidô*:- Prov. Kushiro: Mt. Meakan-dake (July, 1921, K. Togashi; Sept., 1925 & July, 1928, Hiratsuka, f.).

12. **Phragmidium Potentillae** (Pers.) Karsten, Myc. Fenn. IV, p. 49, 1879. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 259, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 29, 1910; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 19, 1934).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbei*). *Honshû*:- Prov. Mutsu: Mt. Iwaki (Sept., 1898, Naoharu Hiratsuka; Aug., 1911, G. Yamada). Prov. Rikuchû: Mt. Hayachine (Oct., 1933, K. Togashi & H. Horigome).

13. **Gymnoconia Peckiana** (Howe) Trotter, Fl. Ital. Crypt. Ured. p. 337, 1910; Sydow, Monogr. Ured. III, p. 84, 1912. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 3, 1934).

On *Rubus pseudo-japonicus* Koidz. (*Hime-goyô-ichigo*). *Hokkaidô*:- Prov. Tokachi: Mt. Tsurugi (July, 1933, H. Tanaka).

14. **Coleosporium Fauriae** Sydow in Ann. Myc. XII, p. 160, 1914. (Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 271, 1927).

On *Fauria Crista-galli* Mak. (*Iwa-ichô*). *Hokkaidô*:- Prov. Ishikari: Mt. Tomuraushi (Aug., 1927, H. Kataoka); Mt. Yûbari-dake (Aug., 1926, S. Iwadare); Mt. Chûbetsu-dake (Aug., 1931, M. Okamoto). *Honshû*:- Prov. Mutsu: Mt. Hakkôda (Aug., 1905, G. Yamada & K. Sawada; Aug., 1913, M. Miura, type!; Sept., 1926, S. Ito & Hiratsuka, f.). Prov. Rikuchû: Mt. Yakeishi-dake (Aug., 1934, K. Togashi; Aug., 1935, K. Togashi & Hiratsuka, f.); Mt. Sukawa-dake (Aug., 1908, G. Yamada). Prov. Ugo: Mt. Komagatake (Aug., 1904, G. Yamada; July, 1929, Y. Shibusaki).

VII. General aspect of rust-flora in the alpine regions of mountains in Japan

The total number of species of rust fungi found in the alpine regions of northern and middle Japan amounts to 83 as shown in the foregoing chapters. All species are enumerated in Table 1, and the number of these species belonging to different genera is shown in Tables 2 and 3.

TABLE 1
Species of rust fungi found in the alpine regions of mountains in South Saghalien, Hokkaidō and Honshū

Species	Daisetsuzan mountain group	Mt. Iwate	Yatsugatake mountain range	Mt. Tsubakuro-dake	Mt. Komagatake (Kiso)	Other mountains
<i>Uromyces amoenus</i>	-	-	-	-	-	+
<i>U. Cacaliae</i>	+	-	-	-	-	+
<i>U. Geranii</i>	-	-	-	-	-	+
<i>U. Hedysari-obscuri</i>	-	-	-	-	-	+
<i>U. japonicus</i>	-	-	-	+	-	+
<i>U. Miurae</i>	-	-	+	-	+	+
<i>U. Peracarpae</i>	-	-	-	-	-	+
<i>U. Rudbeckiae</i>	-	+	+	+	+	+
<i>U. Solidaginis</i>	+	+	+	+	+	+
<i>U. Veratri</i>	-	+	-	+	+	+
<i>U. yatsugatakense</i>	-	-	+	+	-	+
<i>Puccinia alpina</i>	-	-	+	+	+	+
<i>P. asiatica</i>	-	+	-	-	-	+
<i>P. Bistortae</i>	-	-	-	+	-	+
<i>P. calthaecola</i>	+	-	-	-	-	+
<i>P. calumnata</i>	+	-	-	+	+	+
<i>P. Campanulae</i>	+	+	-	-	-	+
<i>P. Circaeae</i>	+	-	+	+	+	+
<i>P. cuneata</i>	-	-	-	+	-	+
<i>P. Epilobii</i>	+	-	-	-	-	+
<i>P. Fergussoni</i>	-	-	-	-	-	+

TABLE 1 (Continued)

Species	Daisetsuzan mountain group	Mt. Iwate	Yatsugatake mountain range	Mt. Tsubakuro-dake	Mt. Komagatake (Kiso)	Other mountains
<i>Puccinia ferruginosa</i>	-	-	-	+	-	+
<i>P. Funkiae</i>	-	+	-	-	-	+
<i>P. Gymnandrae</i>	-	-	-	-	-	+
<i>P. Hieracii</i>	-	-	-	+	+	+
<i>P. Hultenii</i>	+	-	-	-	-	+
<i>P. iwateyamensis</i>	-	+	-	-	-	+
<i>P. Lactuae</i>	-	-	-	+	+	+
<i>P. Majanthemi</i>	+	+	+	+	+	+
<i>P. melanoplaca</i>	-	+	+	+	-	+
<i>P. melasmoides</i>	-	-	-	-	-	+
<i>P. Metanartheccii</i>	-	+	-	-	-	+
<i>P. Nanbuana</i>	+	-	-	-	+	+
<i>P. nitidula</i>	-	+	-	-	-	+
<i>P. pachycephala</i>	-	+	-	-	-	+
<i>P. Polygoni-Weyrichii</i>	-	-	-	+	-	+
<i>P. porphyrogenita</i>	+	-	+	+	+	+
<i>P. Pulsatillae</i>	-	-	+	-	-	+
<i>P. rhytismoides</i>	-	-	-	-	-	+
<i>P. Ribis-japonici</i>	-	-	+	-	-	+
<i>P. Saxifragae</i>	+	-	+	+	+	+
<i>P. Schizocodonis</i>	-	+	+	+	+	+
<i>P. sibirica</i>	-	-	-	-	-	+
<i>P. Togashiana</i>	-	+	-	-	-	+
<i>P. Tokunagai</i>	-	-	-	-	-	+
<i>P. Trautvetteriae</i>	+	+	-	+	+	+
<i>P. Veronicarum</i>	+	-	-	-	-	+
<i>P. vesiculosa</i>	+	-	+	+	+	+
<i>P. Violae</i>	-	+	+	+	+	+
<i>P. Violae-glabellae</i>	+	+	-	+	+	+
<i>P. Virgaureae</i>	-	+	-	-	-	+
<i>P. vomica</i>	-	-	+	-	-	+
<i>Gymnosporangium nipponicum</i>	-	+	-	-	-	+

TABLE 1 (Continued)

Species	Daisetsuzan mountain group	Mt. Iwate	Yatsugatake mountain range	Mt. Tsubakuro-dake	Mt. Komagatake (Kiso)	Other mountains
Phragmidium alpinum	+	-	+	+	+	
Ph. fusiforme	-	-	-	-	-	+
Ph. Itoanum	+	-	+	+	+	
Ph. Miyabeanum	+	-	-	+	+	
Ph. Potentillae	-	-	-	-	-	+
Xenodochnus carbonarius	-	+				
X. minor	+					
Gymnoconia Peckiana	-	-	-	-	-	+
Melampsora Kusanoi	+	-	+	+	+	
Chnoospora Itoana	+	+	+	+		
Melampsorella Caryophyllacearum	-	+	-	-	+	
Melamporidium Alni	-	+				
Pucciniastrum Pyrolae	-	+				
Thekopsora Myrtillina	+	+	+	-	+	
Th. sparsa	+	-	-	-	+	
Th. Tripetaleiae	+	+	-	-	+	
Th. Vacciniorum	+	+	+	+	+	
Hyalopsora Polypodii	-	-	-	-	+	
Uredinopsis filicina	-	+				
Calyptospora Goeppertiana	+	-	+	+	+	
Chrysomyxa alpina	+	-	+			
Ch. Empetri	+	-	+	+	+	
Ch. expansa	-	-	+	-	+	
Ch. Ledi	+	+				
Ch. ledicola	+					
Cronartium kamschaticum	+	-	-	+	+	
Coleosporium Cacaliae	-	-	+	-	+	
C. Fauriae	-	-	-	-	-	+
C. Ligulariae	-	+				
C. Saussureae	+	+	-	-	+	
Total	33	31	26	32	34	14

TABLE 2

Number of genera and species of rust fungi found in the alpine regions of mountains in South Saghalien, Hokkaidô and Honshû

Mountains explored	Number of genera	Number of species
Daisetsuzan mountain group	11	33
Mt. Iwate	12	31
Yatsugatake mountain range	8	26
Mt. Tsubakuro-dake	9	32
Mt. Komagatake (Kiso)	11	34
Other mountains	5	14

TABLE 3

Number of species of rust fungi belonging to different genera found in the alpine regions of mountains in South Saghalien, Hokkaidô and Honshû

Families	Genera	Number of species	
Pucciniaceae	Uromyces	11	61
	Puccinia	41	
	Gymnosporangium	1	
	Phragmidium	5	
	Xenodochnus	2	
	Gymnoconia	1	
Melamporaceae	Melampsora	1	22
	Chnoospora	1	
	Melampsorella	1	
	Melamporidium	1	
	Pucciniastrum	1	
	Thekopsora	4	
	Hyalopsora	1	
	Uredinopsis	1	
	Calyptospora	1	
	Chrysomyxa	5	
Cronartium	1		
Coleosporium	4		
Total		83	

The rust-flora of the alpine regions in our country is made up two families divided into 18 genera and 83 species. Among all these genera, the largest group is the *Puccinia* having 41 species; next come the *Uromyces*, then the *Phragmidium*, the *Chrysomya*, the *Thekopsora* and the *Coleosporium*, each having more than 4 species.

BIOLOGICAL CLASSIFICATION OF SPECIES OF RUST FUNGI FOUND IN THE ALPINE REGIONS OF MOUNTAINS IN JAPAN

Eighty three species of rust fungi found in the alpine regions of mountains in South Saghalien, Hokkaidô and Honshû may be classified into the following seven groups on the basis of biological characters. Firstly, the whole number of species are divided into the two groups; macrocyclic or long-cycled species and microcyclic or short-cycled. Moreover, the macrocyclic species are divided into autoecious and heteroecious ones; the former sub-group is further divided into the three forms; 1) Eu-form (O, I, II, III), 2) Brachy-form (O, II, III) and 3) -opsis form (O, I, III); the latter sub-group is divided into the two forms; Eu- and -opsis forms. The microcyclic group is divided into the two forms; micro- and leptosporic forms. The whole number of species may be thus listed as follows:-

1. Macrocyclic species.

1) *Aut-eu-form*:- *Uromyces Geranii* (DC.) Fr., *U. yatsugatakense* Hirats. f., *Puccinia calthaeicola* Schröt., *P. Funkiae* Diet.,* *P. Lactucae* Diet., *P. Violae* (Schum.) DC., *P. Violae-glabellae* Miura, *Phragmidium fusiforme* Schröt., *Ph. Potentillae* (Pers.) Karst. and *Melampsora Kusanoi* Diet.

2) *Aut-brachy-form*:- *Puccinia Hieracii* (Schum.) Mart. and *P. Nambuana* P. Henn.

3) *Aut-opsis-form*:- *Uromyces Hedysari-obscuri* (DC.) Carest. et Picc., *U. japonicus* Berk. et Curt., *Phragmidium Itoanum* Hirats. f., *Gymnoconia Peckiana* (Howe) Trott. and *Xenodochnus carbonarius* Schlecht.

4) *Heter-eu-form*:- *Uromyces Veratri* (DC.) Schröt., *Puccinia Bistortae* DC., *P. calumnata* Syd.,* *P. Hulthenii* Tranzsch. et Jôrstad,* *P. iwateyamensis* Hirats. f.,* *P. Metanarthezii* Pat.,* *P. nitidula* Tranzsch.,* *P. pachycephala* Diet.,* *P. Polygoni-Weyrichii* T. Miyake,* *P. sibirica*

* The species is provisionally classified, though its genetic relation has never been proved.

Tranzsch., *Melampsorella Caryophyllacearum* Schröt., *Melampsorium Alni* (Thüm.) Diet., *Pucciniastrum Pyrolae* (Karst.) Schröt.,* *Thekopsora Myrtillina* Karst., *Th. sparsa* (Wint.) P. Magn., *Th. Tripetaleiae* Hirats. f.,* *Th. Vacciniorum* Karst.,* *Hyalopsora Polypodii* (Diet.) P. Magn., *Uredinopsis filicina* (Niessl) P. Magn., *Chrysomyxa alpina* Hirats. f.,* *Ch. Empetri* Schröt.,* *Ch. Ledi* De Bary, *Ch. ledicola* Lagerh., *Cronartium kamtschaticum* Jôrstad, *Coleosporium Cacaliae* Otth, *C. Fauriae* Syd.,* *C. Ligulariae* Thüm.* and *C. Saussureae* Thüm.

5) *Heter-opsis-form*:- *Gymnosporangium nipponicum* Yamada, *Calyptospora Goeppertiana* Kühn and *Chrysomyxa expansa* Diet.

2. Microcyclic species.

1) *Microsporic form*:- *Uromyces amoenus* Syd., *U. Cacaliae* (DC.) Unger, *U. Miurae* Syd., *U. Solidaginis* (Sommerf.) Niessl, *Puccinia alpina* Fuck., *P. Campanulae* Carmich., *P. cuneata* Diet., *P. Epilobii* DC., *P. Fergussoni* Berk. et Br., *P. Gymnandrae* Tranzsch., *P. Majanthemi* Diet., *P. melanoplaca* Syd., *P. melasmoides* Tranzsch., *P. porphyrogenita* Curt., *P. Pulsatillae* Kalchbr., *P. rhytismoides* Johans., *P. Schizocodonis* Pat., *P. Tokunagai* Ito et Kawai, *P. Trautvetteriae* Syd. et Holw., *P. vesiculosa* Schlecht., *P. Virgaureae* (DC.) Libert, *Phragmidium alpinum* Hirats. f., *Ph. Miyabeanum* Ito et Hirats. f. and *Xenodochnus minor* Arth.

2) *Leptosporic form*:- *Uromyces Peracarpae* Ito et Tochinai, *U. Rudbeckiae* Arth. et Holw., *Puccinia asiatica* (Kom.) Syd., *P. Circaeae* Pers., *P. ferruginosa* Syd., *P. Ribis-japonici* P. Henn., *P. Saxifragae* Schlecht., *P. Togashiana* Hirats. f., *P. Veronicarum* DC., *P. vomica* Thüm. and *Chrysopsora Itoana* Hirats. f. The above classification of the species may be summarized as in Table 4.

TABLE 4

Biological classification of rust fungi found in the alpine regions of mountains in Japan

Types		Number of species		Percentage	
Macrocyclic species	Aut-eu-form	10	48	12.05	57.83
	Aut-brachy-form	2		2.41	
	Aut-opsis-form	5		6.02	
	Heter-eu-form	28		33.73	
	Heter-opsis-form	3	3.61		
Microcyclic species	Microsporic form	24	35	28.92	42.17
	Leptosporic form	11		13.25	

COMPARISONS OF MACROCYCLIC AND MICROCYCLIC SPECIES OF RUST FUNGI FOUND IN THE ALPINE REGIONS OF MOUNTAINS

The uneven distribution of the microcyclic species of rust fungi was first observed by Johanson (56) in his study of the rust-flora of the mountainous regions of north-central Sweden. He found that a large proportion of the rust fungi of those regions were of the microcyclic species, amounting in fact to about 39 per cent of the total flora (excluding *Uredo*, *Caeoma* and *Aecidium*), while they comprised, according to his estimate, only about 22 per cent in Germany, 20 per cent in Italy, and 13 per cent in Holland.

The increase of microcyclic species on mountain summits was first observed by Magnus (65), who found that in the higher Alps of the Engadine, Switzerland, out of 38 species of *Puccinia* 21 were microcyclic, or 58 per cent, which he ascribed to the shorter season for growth in the higher altitudes, both for host and parasite. The total rust-flora of Switzerland (exclusive of unconnected *Aecidium* and *Uredo*) was estimated by Fischer (11) to be 350 species, of which 10 per cent were microcyclic, while the 76 species occurring above timber-line included 46 per cent of microcyclic species. In 1926, Rainio (70) stated that the microcyclic species found in Lapland constitute 30.8 per cent of the total number of species, while those found in Southern Finland constitute 15.3 per cent of the whole.

Three years later, Arthur (4) reported that the microcyclic species for all North America amount to 18 per cent of the total rust-flora (exclusive of *Uredo* and *Aecidium*), and of these 15 per cent are found in the tropic regions (Mexico, Central America and West Indies), 19 per cent in the temperate (United States and Nova Scotia), and 23 per cent in the boreal (Canada, Newfoundland and Alaska). In 1934, Jørstad (58) published his studies on the rust-flora of Kamchatka, and stated that the microcyclic species found there constitute 23 per cent of the total number.

In Japanese territory, the writer has also observed that there is a relative increase in the number of microcyclic forms towards the north, and also in the regions of high altitude.

The rust-flora of the Japanese Archipelago has not yet been completely explored so the writer can not decidedly conclude that the number of the microcyclic species increases gradually from South

Saghalien and the Kuriles (50°55' N. Lat.) on the north, to the Liu-kius and Formosa (21°45' N. Lat.) on the south. But, some data tending to prove this fact may be stated in the paragraphs.

At first, comparisons were made of rust-floras of South Saghalien (45°54'~50° N. Lat.) at the northern boundary of our territories, and Shikoku (32°42'~34°34' N. Lat.), an island of southern Japan, which are the best explored districts of this country for studies of the rust fungi. It was seen that the number of microcyclic species found in South Saghalien is 29.51 per cent of the total rust-flora, while in Shikoku it is only 9.38 per cent, as shown in Table 5.

TABLE 5
Number of macrocyclic and microcyclic species found in the two different districts, South Saghalien and Shikoku

Districts	Macrocyclic species	Microcyclic species	Percentage of microcyclic species in the total number
South Saghalien [⊙]	122	36	29.51
Shikoku ^{⊙⊙}	222	23	9.38

[⊙] According to Hiratsuka, f. (29, 35) and Kawai & Otani (61).

^{⊙⊙} According to Hiratsuka, f. & Yoshinaga—"Uredinales of Shikoku".

For another example, comparisons have been selected of the rust-floras of the two different mountain groups; Akan group in Hokkaidō, and Daisen group in southern Honshū. The former mountain group is located in the south-eastern part of Hokkaidō and the highest peak, Mt. Meakan-dake attains 1586 meters above sea-level (about 43°23' N. Lat.), while the latter lies in southern Honshū, and Kengamine, the highest peak attains the height of 1731 meters (about 35°22' N. Lat.). The rust-floras of the above two mountain groups were studied by the writer several years ago, and the data obtained as shown in Table 6.

TABLE 6
Number of macrocyclic and microcyclic species found in the two different mountain groups, Akan and Daisen

Mountains	Macrocyclic species	Microcyclic species	Percentage of microcyclic species in the total number
Akan [⊙]	90	23	20.35
Daisen ^{⊙⊙}	93	13	12.26

[⊙] Species found in regions higher than about 400m above sea-level.

^{⊙⊙} Species found in regions higher than about 700m above sea-level.

From Table 6, it will be seen that microcyclic species in the Akan mountain group are more numerous than those in the Daisen, although the total number of species in the two mountain groups is nearly equal. This may be due to the fact that the Akan group is located farther north than the Daisen group.

The two examples, above stated, may be explained by the theory that the number of microcyclic species increases relatively from south to north in our territories.

As already shown in Table 4, the microcyclic species of rust fungi found in the alpine regions of mountains in this country are 35 in number or 42.17 per cent of the total number of species. Further, the percentage of number of the microcyclic species in the whole number of species found in the alpine regions of the five mountains best explored by the writer is shown in Table 7.

TABLE 7

Number of macrocyclic and microcyclic species found in the alpine regions of Daisetsuzan Mts., Mt. Iwate, Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)

Mountains	Macrocyclic species	Microcyclic species	Percentage of microcyclic species in the total number
Daisetsuzan Mts.	18	15	45.45
Mt. Iwate	20	11	35.48
Yatsugatake Mts.	11	15	57.46
Mt. Tsubakuro-dake	16	16	50.00
Mt. Komagatake (Kiso)	21	13	38.24

The increase of microcyclic species in the alpine regions may be shown from the data on rust-flora of the two different mountains; Daisetsuzan and Yatsugatake.

First, a comparison was made between the number of species found in the alpine regions in Daisetsuzan mountain group, and that of species collected in the forest regions on the east side of Mt. Kuro-dake near Sounkei Hot Spring at the foot of this mountain group (about 600 m above sea-level). Secondly, the number of species found in the alpine regions of Yatsugatake mountain range was compared with that of species found in Okoyadaira and Manaita-bara (about 1000~1500m above sea-level), prairie regions, which are

located at the western foot of this mountain range. The results of these comparisons are shown in Tables 8 and 9.

TABLE 8

Number of macrocyclic and microcyclic species found in the alpine regions and in the forest regions at the foot of Daisetsuzan mountain group

Regions	Macrocyclic species	Microcyclic species	Percentage of microcyclic species in the total number
Alpine regions	18	15	45.45
Forest regions*	46	15	29.51

* Forest regions near Sounkei Hot Spring (about 600m above sea-level)

TABLE 9

Number of macrocyclic and microcyclic species found in the alpine regions and in the prairie regions of Yatsugatake mountain range

Regions	Macrocyclic species	Microcyclic species	Percentage of microcyclic species in the total number
Alpine regions	11	15	57.46
Prairie regions*	41	7	14.68

* Okoya-daira and Manaita-bara, about 1000~1500m above sea-level.

From Tables 8 and 9, one can see that the number of microcyclic species increases relatively in the alpine regions over the number at the mountain foot.

CORRELATION BETWEEN THE AIR TEMPERATURES AND THE RELATIVE INCREASE OF MICROCYCLIC SPECIES IN THE REGIONS OF HIGH ALTITUDE AND TOWARDS THE NORTH LATITUDE

As Magnus (65), Arthur (4), the writer (43) and others have already pointed out, the phenomena of the relative increase of microcyclic species towards the north and in the regions of high altitude are due to some environmental factors, such as air temperature, atmospheric pressure, ultra-violet rays and others, influencing the fungi themselves and their host plants. Among these factors,

the air temperature is considered to be the most important one.

In the present chapter will be treated the correlation between the air temperatures and the relative increase of microcyclic species towards the north and in the regions of high altitude.

I. Approximate air temperatures in the alpine regions of Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)

The air temperatures in the alpine regions of the three mountains of middle Honshû; Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso), have not been observed. But approximate calculations of the air temperatures in the alpine regions of the Yatsugatake mountain range can be made from the air temperatures at Kôfu, those in the same regions of Mt. Tsubakuro-dake from those at Matsumoto, and those in Mt. Komagatake (Kiso) from those at Iida, using in all cases, the mean gradient of air temperatures per 100 meters on Mt. Tsukuba, Nikkô (Shôbuhama), Fujimi and Mt. Ibuki, middle Honshû, as shown in Table 11.

From Tables 10 and 11, are obtained the data of Table 12 showing the mean air temperatures in the alpine regions of the three mountains.

Stations				Length of records in years	
Name	N. Lat.	E. Long.	Height above sea-level in meters	Jan	Year
Iida	35°31'	137°50'	483.7	-0.1	29
Matsumoto	36°14'	137°59'	582.1	-2.2	29
Kôfu	35°38'	138°34'	261.3	1.2	30

* According to "Climatic Atlas of Japan and her neighbouring countries"

Gradient of air temperatures

Mountains observed	Year	
	Dec.	Year
Mt. Tsukuba, prov. Hitachi (870m above sea-level)*	0.34	0.52
Nikkô (Shôbuhama), prov. Shimotsuke (1270 m above sea-level)**	0.48	0.54
Fujimi, prov. Shinano (982 m above sea-level)**	0.58	0.53
Mt. Ibuki, prov. Omi (1376 m above sea-level)*	0.63	0.60
Mean	0.51	0.55

* According to T. Okada - "Meteorology" (*Kishô-gaku*), 1927.

** According to T. Hirata in Special Bulletin of Forest Meteorology

Approximate air temperatures

Mountains	Upper and lower limits of the alpine regions in meters		Year		
	Upper limits	Lower limits	Jan.	Feb.	
Yatsugatake Mts.	2899	2400	-13.0~-10.3	-11.7~-7.4	-1.2~1.5
Mt. Tsubakuro-dake	2763.4	2400	-13.9~-12.0	-13.4~-8.5	-1.8~0.2
Mt. Komagatake(Kiso)	2956	2500	-14.0~-11.0	-13.5~-8.0	-2.6~0.6

TABLE 10
Air temperatures at Kôfu, Matsumoto and Iida*

Stations				Air temperatures (Degrees Centigrade)												Length of records in years	
Name	N. Lat.	E. Long.	Height above sea-level in meters	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.		Year
Iida	35°31'	137°50'	483.7	-0.1	0.8	4.3	10.9	14.9	19.3	23.2	23.8	19.9	13.2	7.4	2.3	11.7	29
Matsumoto	36°14'	137°59'	582.1	-2.2	-1.4	2.3	9.1	13.8	18.5	22.4	22.8	18.6	11.8	6.0	0.8	10.2	29
Kôfu	35°38'	138°34'	261.3	1.2	2.8	6.5	12.7	16.6	20.9	24.8	25.4	21.7	15.2	9.1	3.5	13.4	30

* According to "Climatic Atlas of Japan and her neighbouring countries" by the Central Meteorological Observatory (Tokyo) (1930).

TABLE 11
Gradient of air temperatures per 100 meters on Mt. Tsukuba, Nikkô (Shôbuhama), Fujimi and Mt. Ibuki, middle Honshû

Mountains observed	Gradient (Degrees Centigrade)												Year
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Mt. Tsukuba, prov. Hitachi (870m above sea-level)*	0.41	0.61	0.57	0.55	0.59	0.60	0.54	0.54	0.56	0.50	0.42	0.34	0.52
Nikkô (Shôbuhama), prov. Shimotsuke (1270 m above sea-level)**	0.49	0.46	0.59	0.59	0.66	0.57	0.53	0.63	0.57	0.47	0.44	0.48	0.54
Fujimi, prov. Shinano (982 m above sea-level)**	0.62	0.48	0.58	0.48	0.55	0.52	0.43	0.63	0.55	0.48	0.47	0.58	0.53
Mt. Ibuki, prov. Omi (1376 m above sea-level)*	0.65	0.64	0.63	0.59	0.57	0.52	0.65	0.63	0.58	0.53	0.54	0.63	0.60
Mean	0.54	0.55	0.59	0.55	0.59	0.55	0.54	0.61	0.57	0.50	0.47	0.51	0.55

* According to T. Okada—"Meteorology" (*Kishô-gaku*), 1927.

** According to T. Hirata in Special Bulletin of Forest Meteorological Stations (Department of Agriculture and Commerce, Japan), no. 7, p. 1~20, 1922.

TABLE 12
Approximate air temperatures in the alpine regions of Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)

Mountains	Upper and lower limits of the alpine regions in meters		Approximate air temperatures in the alpine regions (Degrees Centigrade)												Year
	Upper limits	Lower limits	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
Yatsugatake Mts.	2899	2400	-13.0~-10.3	-11.7~-9.0	-9.1~-6.1	-1.8~0.9	1.0~4.0	6.4~9.1	10.5~13.2	9.4~12.4	6.7~9.5	1.5~4.5	-3.2~-1.0	-9.5~-7.4	-1.2~1.5
Mt. Tsubakuro-dake	2763.4	2400	-13.9~-12.0	-13.4~-11.4	-10.5~-8.4	-2.9~-0.9	1.0~3.1	6.5~8.5	10.7~12.6	9.5~11.7	6.1~8.2	0.9~2.7	-4.2~-2.5	-10.3~-8.5	-1.8~0.2
Mt. Komagatake (Kiso)	2956	2500	-14.0~-11.0	-13.5~-10.3	-10.9~-7.6	-3.4~-0.2	-0.3~3.0	5.3~8.5	9.3~12.3	8.1~11.5	5.1~8.4	0.3~3.1	-4.8~-2.1	-10.9~-8.0	-2.6~0.6

TABLE 13
Air temperatures in South Saghalien and Shikoku*

Districts	Stations				Air temperatures (Degrees Centigrade)													Length of records in years
	Name	N. Lat.	E. Long.	Height above sea-level in meters	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
South Saghalien	Shisuka	49°14'	143° 7'	3.5	-17.9	-15.0	-9.2	-0.8	3.9	8.7	13.1	15.7	11.7	4.8	-5.2	-13.5	-0.3	19
	Ochiai	47°20'	142°47'	27.4	-14.9	-13.3	-8.0	0.5	5.6	10.7	14.9	17.0	12.5	6.0	-2.3	-9.2	1.6	19
	Maoka	47° 3'	142° 3'	28.8	-9.7	-8.3	-4.6	2.1	6.5	11.4	15.3	17.8	13.9	7.5	-0.1	-6.0	3.8	19
	Honto	46°40'	141°52'	5.5	-8.6	-7.6	-4.5	2.4	7.0	11.9	16.0	18.5	14.3	7.9	0.8	-4.9	4.4	7
	Otomari	46°39'	142°46'	37.3	-11.3	-10.0	-5.9	1.0	5.5	10.2	14.5	17.2	13.4	7.2	-0.5	-6.8	2.9	21
Shikoku	Matsuyama	33°50'	132°45'	32.4	4.8	4.8	7.8	12.9	17.0	21.2	25.3	26.3	22.7	16.7	11.6	6.8	14.8	30
	Niihama	33°58'	133°16'	5.1	5.7	5.6	8.0	13.0	17.4	21.4	25.5	26.9	23.5	17.8	12.6	8.0	15.5	27
	Tadotsu	34°17'	133°46'	5.3	5.3	5.2	7.6	12.7	17.2	21.3	25.6	27.1	23.4	17.4	12.3	7.6	15.2	30
	Tokushima	34° 4'	134°33'	3.9	5.2	5.3	8.1	13.6	17.9	21.7	25.6	26.8	23.3	17.7	12.3	7.3	15.4	30
	Kôchi	33°33'	133°32'	42.1	5.5	6.1	9.4	14.5	18.1	21.6	25.0	26.1	23.2	17.7	12.3	7.2	15.6	30
	Muroto	33°15'	134°11'	186.1	6.6	7.4	9.2	14.4	18.1	20.5	24.1	25.9	23.6	18.5	13.6	9.1	15.9	6

* According to "Climatic Atlas of Japan and her neighbouring countries" by the Central Meteorological Observatory (Tokyo) (1930).

TABLE 14
Air temperatures at Haboro and Sakai*

Name	Stations			Air temperatures (Degrees Centigrade)													Length of records in years
	N. Lat.	E. Long.	Height above sea-level in meters	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
Haboro	44°23'	141°42'	20.6	-6.6	-4.9	-2.6	4.3	8.8	14.1	18.6	20.3	16.8	10.2	3.6	-2.1	6.7	6
Sakai	35°33'	133°14'	2.9	4.1	4.1	6.7	12.0	16.2	20.5	24.7	25.9	22.1	16.3	11.2	6.3	14.2	30

* According to "Climatic Atlas of Japan and her neighbouring countries" by the Central Meteorological Observatory (Tokyo) (1930).

TABLE 15
Approximate air temperatures in the districts of Akan and Daisen mountain groups, whose rust-floras were explored

Mountains	Upper & lower limits of the districts, whose rust-floras were explored (in meters)		Approximate air temperatures (Degrees Centigrade)													
	Upper limit	Lower limit	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year	
Akan Mts.	1586	400	-15.2~8.7	-13.5~7.0	-11.2~4.7	-4.3~2.2	0.2~6.7	5.5~12.0	10.0~16.5	11.7~18.2	8.2~14.7	1.6~8.1	-4.0~1.5	-10.7~4.2	-1.9~4.6	
Daisen Mts.	1731	700	-6.0~-0.3	-6.0~-0.3	-3.8~1.9	1.5~7.2	5.7~11.4	10.0~15.7	14.2~19.9	15.4~22.4	11.6~17.3	5.8~11.5	0.7~6.4	-4.2~1.5	3.7~9.4	

II. Correlation between the relative increase in the number of rust-floras

In the preceding chapter rust-floras of both South Saghalien and Shikoku, that is, microcyclic species in South Saghalien constitute 29.51 per cent of the whole in the former district, and the air temperatures in South Saghalien are lower than those in Shikoku. The correlation between the air temperatures compiled from 19 stations in both districts are shown in Table 13.

A perusal of Table 13 shows that the mean air temperatures in South Saghalien are lower than those in Shikoku. The mean air temperature of a year in the former district is 14.8°C, while that in the latter is 14.8 to 15.9°C.

In comparisons between mountain groups; Akan and Daisen mountain groups; the former mountain group (high level) constitute 20.35 per cent of the whole in the latter mountain group (low level) constitute only 12.26 per cent of the whole mentioned.

The writer calculated the correlation between the districts of the Akan mountain group and those in the districts of Shikoku. The mean temperatures at Sakai and Haboro are shown in Table 14. Thus, the correlation between the mean temperatures in the districts of Shikoku and those in the districts of the Akan mountain group is as in Table 15. From Table 15, it is seen that a correlation exists between the relative increase of the number of rust-floras and the relative increase of the number of rust-floras.

III. Conclusive summary between the air temperature and the relative increase of rust-floras

The data of correlation between the relative increase of microcyclic rust-floras and the relative increase of the number of rust-floras are shown in Table 16.

Districts	Stations				Jan.	Length of records in years
	Name	N. Lat.	E. Long.	Height above sea-level in meters		
South Saghalien	Shisuka	49°14'	143° 7'	3.5	-1	19
	Ochiai	47°20'	142°47'	27.4	-1	19
	Maoka	47° 3'	142° 3'	28.8	-	19
	Honto	46°40'	141°52'	5.5	-	7
	Otomari	46°39'	142°46'	37.3	-1	21
Shikoku	Matsuyama	33°50'	132°45'	32.4	4	30
	Niihama	33°58'	133°16'	5.1	5	27
	Tadotsu	34°17'	133°46'	5.3	5	30
	Tokushima	34° 4'	134°33'	3.9	5	30
	Kôchi	33°33'	133°32'	42.1	5	30
	Muroto	33°15'	134°11'	186.1	6	6

* According to "Climatic Atlas of Japan and her neighbouring countries"

Name	Stations			Jan.	Feb.	Length of records in years
	N. Lat.	E. Long.	Height above sea-level in meters			
Haboro	44°23'	141°42'	20.6	-6.6	-4.9	6
Sakai	35°33'	133°14'	2.9	4.1	4.1	30

* According to "Climatic Atlas of Japan and her neighbouring countries"

Mountains	Upper & lower limits of the districts, whose rust-floras were explored (in meters)		Jan.	Feb.	Year
	Upper limit	Lower limit			
Akan Mts.	1586	400	-15.2~-8.7	-13.5~-7.6	-1.9~4.6
Daisen Mts.	1731	700	-6.0~-0.3	-6.0~-0.3	3.7~9.4

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II. Correlation between the air temperatures and the relative increase of microcyclic species in the northern districts

In the preceding chapter, the writer made comparisons the rust-floras of both South Saghalien and Shikoku, and showed that the microcyclic species in South Saghalien are more numerous than those in Shikoku, that is, microcyclic species in the former district constitute 29.51 per cent of the total number, as against only 9.38 per cent of the whole in the latter district. Then, to compare the air temperatures in South Saghalien and Shikoku, the mean air temperatures compiled from the records of the meteorological stations in both districts are shown in Table 13.

A perusal of Table 13 shows that the air temperatures in South Saghalien are lower than those in Shikoku. The mean air temperature of a year in the former district ranges -0.3 to 4.4°C , while that in the latter is 14.8 to 15.9°C .

In comparisons between the rust-floras of the two different mountain groups; Akan and Daisen, the microcyclic species in the former mountain group (higher than about 400 m above sea-level) constitute 20.35 per cent of the total number of species, while those in the latter mountain group (higher than about 700 m above sea-level) constitute only 12.26 per cent of the whole, as already mentioned. The writer calculated approximate air temperatures in the districts of the Akan mountain group which were explored, from the mean temperatures at Haboro near the mountain group, and those in the districts of the Daisen mountain group from the mean temperatures at Sakai near its foot, taking 0.55°C , the mean gradient (in year) of air temperatures per 100 meters, as already shown in Table 11. Thus, the writer obtained approximate air temperatures in the districts in which the rust-floras were explored, as in Table 15. From Table 15, it may be also seen that a close correlation exists between the lower air temperatures and the relative increase of the number of microcyclic species.

III. Conclusive summary of the data on correlation between the air temperatures and the relative increase of microcyclic species

The data of correlation between the air temperatures and the relative increase of microcyclic species towards the north and in the

regions of high altitude in the preceding paragraphs, are summarized in Table 16. This table shows the percentage of number of microcyclic species in each district or in the alpine regions of the mountains and the mean air temperature for the four months (June to September) and for the year at each locality.

TABLE 16

Conclusive summary of the data on correlation between the air temperatures and the relative increase of microcyclic species

Regions or districts	Percentage of microcyclic species in the total number	Mean air temperatures (Degrees Centigrade)				
		June	July	Aug.	Sept.	Year
South Saghalien	29.51	8.7~11.9	13.1~16.0	15.7~18.5	11.7~14.3	-0.3~4.4
Shikoku	9.38	20.5~21.7	24.1~25.6	25.9~27.1	22.7~23.6	14.8~15.9
Akan Mts.	20.35	5.5~12.0	10.0~16.5	11.7~18.2	8.2~14.7	1.9~4.6
Daisen Mts.	12.26	10.0~15.7	14.2~19.9	15.4~21.1	11.6~17.3	3.7~9.4
Alpine regions of Yatsugatake Mts.	57.46	6.4~9.1	10.5~13.2	9.4~12.4	6.7~9.5	-1.2~1.5
Alpine regions of Mt. Tsubakuro-dake	50.00	6.5~8.5	10.7~12.6	9.5~11.7	6.1~8.2	-1.8~0.2
Alpine regions of Mt. Komagatake (Kiso)	38.24	5.3~8.5	9.3~12.3	8.5~11.5	5.1~8.4	-2.6~0.6

MICROSPORIC AND LEPTOSPORIC FORMS OF MICROCYCLIC SPECIES OF RUST FUNGI FOUND IN THE ALPINE REGIONS OF MOUNTAINS

Dietel (8, 9), Mayor (66) and Arthur (4) have stated that the leptosporic forms of microcyclic species are much more common in the warmer regions than northward in colder regions, and in protected valley locations than on mountain summits.

As already shown in Table 4, the total number of microcyclic species of rust fungi found in the alpine regions in this country is 35, and among these species 24, or 68.57 per cent, of the whole number are microsporic forms. The microcyclic species in the alpine regions of the five mountains which were best explored by the writer are divided into the two forms; microsporic and lepto-

sporic, as shown in Table 17.

TABLE 17

Number of microsporic and leptosporic forms of microcyclic species found in the alpine regions of Daisetsuzan Mts., Mt. Iwate, Yatsugatake Mts., Mt. Tsubakuro-dake and Mt. Komagatake (Kiso)

Mountains	Microsporic forms	Leptosporic forms	Percentage of microsporic species in the total number
Daisetsuzan Mts.	11	4	73.33
Mt. Iwate	7	4	63.63
Yatsugatake Mts.	10	5	66.67
Mt. Tsubakuro-dake	11	5	68.75
Mt. Komagatake (Kiso)	10	3	76.92

It will be understood that the microsporic species are always predominant in the alpine regions in these mountains.

The fact that there is a relative increase in the number of microsporic forms in microcyclic species towards the higher altitudes, will be shown in the rust-floras of Yatsugatake mountain range and Daisetsuzan mountain group.

The flora of Yatsugatake range may be divided into the three different regions; alpine, forest and prairie regions. The microcyclic species found in each region are enumerated as in the following table.

TABLE 18

Microsporic and leptosporic forms of microcyclic species in different regions of Yatsugatake mountain range

Regions	Forms	Species	Number of species	Percentage of microsporic species in the total number
Alpine regions (2400-2899 m above sea-level)	Microsporic	Uromyces Miurae U. Solidaginis Puccinia alpina P. Majanthemi P. melanoplaca P. porphyrogenita P. Pulsatillae P. Schizocodonis P. vesiculosa Phragmidium alpinum	10	66.67

TABLE 18 (Continued)

Regions	Forms	Species	Number of species	Percentage of microsporidic species in the total number
Alpine regions	Lepto- sporidic	Uromyces Rudbeckiae Puccinia Circaeae P. Ribis-japonici P. Saxifragae P. vomica	5	35.71
Forest regions (1400-2400 m above sea-level)	Micro- sporidic	Puccinia Haleniae P. melanoplaca P. Waldsteiniae Tranzschelia fusca Triphragmium Thwaitesii	5	
	Lepto- sporidic	Uromyces Rudbeckiae Puccinia asiatica P. Chrysosplenii P. Circaeae P. ferruginosa P. Ribis-japonici P. Saxifragae P. vomica Chnoospora Itoana	9	
Prairie regions (Okoya-daira & Manaita-bara, above 1000-1400 m above sea-level)	Micro- sporidic	Tranzschelia fusca Triphragmium Thwaitesii	2	
	Lepto- sporidic	Uromyces Rudbeckiae Puccinia ferruginosa P. Glechomatis P. Horiana P. Saxifragae	5	

A perusal of the above table shows at once that the number of microsporidic species increases gradually from the plain to the alpine regions.

Next, comparisons of the microsporidic forms of microcyclic species found in the alpine regions of Daisetsuzan mountain group, and those in the forest regions near Sounkei, at the foot of this mountain group, were made with results as shown in Table 19.

TABLE 19

Microsporidic and leptosporidic forms of microcyclic species in different regions of Daisetsuzan mountain group

Regions	Forms	Species	Number of species	Percentage of microsporidic species in the total number
Alpine regions	Micro- sporidic	Uromyces Cacaliae U. Solidaginis Puccinia Campanulae P. Epilobii P. Majanthemi P. porphyrogenita P. Trautvetteriae P. vesiculosa Phragmidium alpinum Ph. Miyabeana Xenodochus minor	11	73.33
	Lepto- sporidic	Puccinia Circaeae P. Saxifragae P. Veronicarum Chnoospora Itoana	4	
Forest regions	Micro- sporidic	Puccinia Adoxae R. hakkodensis P. Majanthemi P. porphyrogenita P. Trautvetteriae P. Waldsteiniae	6	40.00
	Lepto- sporidic	Uromyces Peracarpae U. Rudbeckiae Puccinia asiatica P. Chrysosplenii P. Circaeae P. ferruginosa P. Saxifragae P. Schizonepetae Chnoospora Itoana	9	

It will be seen from the above tabulation, that the total number of the microsporidic species in both regions is quite equal, but microsporidic species are more frequent in the alpine regions, as in the case of the Yatsugatake mountain range. The microsporidic species in the alpine regions are 11, while those in the forest regions are only 6 in number.

It is evident therefore from the above two examples, that a high proportion of the microsporidic species is to be found in the alpine regions.

**GEOGRAPHICAL DISTRIBUTION OF RUST
FUNGI FOUND IN THE ALPINE REGIONS
OF MOUNTAINS IN JAPAN**

I. Distribution of species in Japan

In this section, the distribution of the 83 species of rust fungi found in the alpine regions in this country is shown, based mainly upon the writer's own collections. A survey of scientific literature gives a number of additional localities and hosts in this country and adds materially to the distribution as shown by the herbarium materials examined.

1. **Uromyces amoenus** Sydow (Hara in Shidzuoka-ken-Nōkai-hō, XXXIV, no. 10, p. 56 & fig. 3, 1930).

On *Anaphalis alpicola* Mak. (*Takane-usuyukisō*). Honshū:- Prov. Suruga: Mt. Akaishi. This fungus has been found in this country only in Mt. Akaishi.

2. **Uromyces Cacaliae** (DC.) Unger (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 232, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (2), 1929; Mem. Tottori Agric. Coll. I, p. 63, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 214, 216 & 229, 1931; Bot. & Zool. II, p. 545, 1934; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 212 & pl. VII, fig. 1, 1922; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 78, 1933).

On *Cacalia auriculata* DC. var. *kamtschatica* Maxim. (*Cacalia kamtschatica* Kudo) (*Kani-kōmori*). S. Saghalien:- Mt. Suzuya; Mt. Tosso; Shiritori. Hokkaidō:- Prov. Ishikari: Mt. Teine; Mt. Kuro-dake; Mt. Hakuun-dake. Prov. Kushiro: Mt. Oakan-dake. Kuriles:- Etorofu. Kunashiri: Mt. Chacha-nupuri.

3. **Uromyces Geranii** (DC.) Fries (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (4), 1929; Mem. Tottori Agric. Coll. I, p. 65, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 31, 1932; Hiratsuka, f. & Hashioka in Bot. Mag. Tokyo, XLIX, p. 520, 1935). Syn. *Uromyces Geranii* Otth et Wartm. (Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 248 & pl. VIII, fig. 17, 1922; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc.

XI, p. 238, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 78, 1933; Togashi in Jap. Jour. Bot. II, p. 91, 1924).

On *Geranium erianthum* DC. (*Chishima-fūro*). S. Saghalien:- Ōdomari; Takinosawa (Noboripo); Mt. Tosso; Kushunnai; Ambetsu; Nayoshi; Horochi. Hokkaidō:- Prov. Kitami: Momoiwa (Rebun). Kuriles:- Kunashiri: Furukamappu. Urup: Tokotan; Daiba-hama. Paramushir: Murakami-wan. Honshū:- Prov. Rikuchū: Mt. Yakeishi-dake.

On *Geranium sibiricum* L. (*Ichige-fūro*). S. Saghalien:- Toyohara.

On *Geranium Suzukii* Masamune (*Taiwan-fūro*). Formosa:- Prov. Taihoku: Mt. Nanko.

On *Geranium shikokianum* Matsum. (*Shikoku-fūro*). Honshū:- Prov. Hōki: Mt. Daisen.

4. **Uromyces Hedysari-obscuri** (DC.) Carestia et Piccone (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (3), 1929; Mem. Tottori Agric. Coll. I, p. 64, 1930; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 222 & pl. VII, fig. 8, 1922; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 162, 1930).

On *Hedysarum obscurum* L. var. *neglectum* Trautv. (*Chishima-genge*). S. Saghalien:- Chikahoronai; Takinosawa (Noboripo); Mt. Kashipo; Mt. Tosso. Hokkaidō:- Prov. Kitami: Momoiwa (Rebun). Kuriles:- Shikotan; Shakotan. Urup: Tokotan. Shimushir: Shimushir-wan. Araitō: Sakichi-zaki.

5. **Uromyces japonicus** Berkeley et Curtis in Proc. Amer. Acad. Arts & Sci. IV, p. 126, 1858. (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (4), 1929; Mem. Tottori Agric. Coll. I, p. 66, 1930; Jour. Jap. Bot. X, p. 134, 1934; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 256 & pl. VIII, fig. 24, 1922; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Miquel, Prolusio Florae japonicae, p. 392, 1867; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 78, 1933; Togashi in Jap. Jour. Bot. II, p. 91, 1924). Syn. *Uromyces reticulatus* Bubák (Sydow in Ann. Myc. XI, p. 94, 1913). *Uromyces acutatus* (not Fuckel) (Kawakami in Bot. Mag. Tokyo, XIV, p. (106), 1900.

On *Allium Victorialis* L. (*Gyôjya-ninniku*). *S. Saghalien*:- Todomoshiri; Naibuchi; Kurokawa; Ochiai. *Hokkaidô*:- Prov. Kitami: Mt. Rishiri. Prov. Kushiro: Biruwa; Mt. Meakan-dake. Prov. Nemuro: Nemuro; Tomoshiri. Prov. Tokachi: Shintoku. Prov. Teshio: Horonobe-mura. Prov. Iburi: Muroran; Mt. Makkari-nupuri; Lake-side of Shikotsu-ko. Prov. Ishikari: Sapporo; Mt. Moiwa; Mt. Sapporo-dake; Mt. Teine; Sônukei; Mt. Kuro-dake. Prov. Oshima: Hakodate. *Kuriles*:- Kunashiri: Shiranuka; Mt. Chacha-nupuri. Etorofu: Shana. Shimushir: Broughton-wan. Rashedu. *Honshû*:- Prov. Shinano: Mt. Tsubakuro-dake; Mt. Asama. Prov. Rikuchû: Matsukusa; Mt. Yakeishi-dake.

6. ***Uromyces Miurae*** Sydow in Ann. Myc. XI, p. 94, 1913. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 134, 1934; Bot & Zool. II, p. 543 & 544, 1934; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 260 & pl. IX, fig. 3, 1922).

On *Fritillaria camschatensis* Ker. (*Kuro-yuri*). *Hokkaidô*:- Prov. Iburi: Lake-side of Shikotsu-ko. *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Komagatake (Kiso); Mt. Shirouma-dake.

7. ***Uromyces Peracarpae*** Ito et Tochinai in Ito in Bot. Mag. Tokyo, XL, p. 278 & fig. 1, A, 1926. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Mem. Tottori Agric. Coll. I, p. 64, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 130 & 230, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 162, 1930).

On *Peracarpa carnosus* Hook. f. et Thoms. (*Tani-gikyô*). *S. Saghalien*:- Mt. Tosso. *Hokkaidô*:- Prov. Ishikari: Sapporo; Mt. Teine; Ochiai; Sôunkei. Prov. Tokachi: Shikaribetsu-numa. Prov. Kitami: Sarufuto-mura; Mt. Rishiri. Prov. Kushiro: Mt. Meakan-dake.

8. ***Uromyces Rudbeckiae*** Arthur et Holway (Dietel in Engl. Bot. Jahrb. XXXVII, p. 99, 1905; Ann. Myc. VIII, p. 305, 1910; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Transact. Tottori Soc. Agric. Sci. II, p. 233, 1931; III, p. 215, 217, 218, 219 & 229, 1931; IV, p. 31 & 156, 1933; Bot. & Zool. II, p. 543 & 544, 1934; Bot. Mag. Tokyo, XLIX, p. 145, 1935; Jour. Jap. Bot. XI, p. 39 & 276, 1935; Hiratsuka, f. & Hashioka in Transact. Tottori Soc. Agric. Sci. IV, p. 156, 1933; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (78), 1928; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 215 &

pl. VII, fig. 3, 1922; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 78, 1933; Sawada, Descript. Cat. Formosan Fung. VI, p. 42, 1933; Togashi in Jap. Jour. Bot. II, p. 91, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 31, 1934; Togashi & Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XVI, p. 79, 1924; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930). Syn. *Uromyces Rudbeckiae* forma *Virgaureae* Hennings in Hedwigia XL, p. 125, 1901. (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902). *Uromyces sakaensis* Hennings in Hedwigia XLII, p. (107), 1903. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904). *Uromyces Komarovii* Bubak (Sydow in Ann. Myc. XI, p. 93, 1913).

On *Solidago Virgaurea* L. (*Akinokirinsô*). *S. Saghalien*:- Ôdomari: Tonnaicha-sandô. *Hokkaidô*:- Prov. Kitami: Uennai (Rebun); Noshappu-saki near Wakkanai. Prov. Oshima: Fukuyama. Prov. Ishikari: Shinotsu; Garugawa; Mt. Teine; Kamikawa-mura; Jôzankei; Mt. Mo-iwa: Horomui; Sapporo. Prov. Iburi: Mt. Makkari-nupuri. Prov. Shiribeshi: Zenibako-tôge; Otaru; Akaiwa near Otaru. Prov. Tokachi: Lake-side of Shikaribetsu-numa. Prov. Kushiro: Bokke (Akan); Onne-moshiri (Lake Akan); Mt. Oakan-dake. *Kuriles*:- Kunashiri: Nishiro; Mt. Chacha-nupuri. *Honshû*:- Prov. Mutsu: Ishie; Mt. Hak-kôda. Prov. Rikuchû: Mt. Iwate; Mt. Hayachine. Prov. Musashi: Ômiya. Prov. Sagami: Kamakura. Prov. Shimotsuke: Mt. Shirane (Nikkô). Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso). Prov. Inaba: Tottori; Mt. Okinosen; Inabayama near Tottori; Seijô-mura. Prov. Hôki: Mt. Daisen; Daisenji. *Shikoku*:- Prov. Tosa: Sakawa-machi; Kuroiwa-mura. Prov. Iyo: Mt. Ishidzuchi. *Kiushû*:- Prov. Higo: Kumamoto; Mt. Aso. Prov. Bungo: Mt. Kuju. Prov. Satsuma: Sakura-jima. *Korea*:- Prov. Kôgen: Shinkeiji (Soto-Kongô). *Formosa*:- Prov. Tainan: Mt. Arisan. Prov. Shinchiku: Mt. Izawa (Taiha Mts.).

On *Solidago* sp. (*Solidago hachijoensis* Nakai?). *Honshû*:- Prov. I-dzu: Hachijô-shima.

9. ***Uromyces Solidaginis*** (Sommerf.) Niessl (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (3), 1929; Mem. Tottori Agric. Coll. I, p. 64, 1930; Transact. Tottori Soc. Agric. Sci. III, p.

215, 216, 217, 218, 219, 220 & 230, 1931; IV, p. 31, 1932; Bot. & Zool. II, p. 543 & 545, 1934; Ito in Jour. Coll. Hokkaido Imp. Univ. XI, p. 214 & pl. VII, fig. 2, 1922; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 261, 1927; Kawakami in Bot. Mag. Tokyo, XIV, p. (106), 1900; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 79, 1933; Sydow in Ann. Myc. XI, p. 93 & 158, 1914; Togashi in Jap. Jour. Bot. II, p. 92, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 31, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). *S. Saghalien*:- Mt. Shiritori; Mt. Tosso; Mt. Kashipo; Maoka; Sakaehama. *Hokkaidô*:- Prov. Ishikari: Mt. Hokkai-dake; Mt. Kuro-dake; Kumonotaira (*Daisetsuzan*). Prov. Kitami: Mt. Rishiri. Prov. Kushiro: Rubeshibe (*Akan*); Mt. Oakan-dake; Mt. Meakan-dake; Pon-moshiri (*Akan*). Prov. Iburri: Mt. Makkari-nupuri. Prov. Shiribeshi: Raiden-tôge. *Kuriles*:- Shikotan: Shakotan. Kunashiri: Nikishiro. *Honshû*:- Prov. Mutsu: Mt. Hakkôda; Mt. Iwaki. Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake; Mt. Hayachine. Prov. Ugo: Mt. Chôkai. Prov. Shimotsuke: Mt. Shirane (*Nikkô*). Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (*Kiso*). Prov. Suruga: Mt. Akaishi. Prov. Echigo: Hirono. Prov. Hôki: Mt. Daisen.

10. **Uromyces Veratri** (DC.) Schröter (Dietel in Engl. Bot. Jahrb. XXXII, p. 624, 1903; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Mem. Tottori Agric. Coll. I, p. 66, 1930; Bot. & Zool. II, p. 545, 1934; Transact. Tottori Soc. Agric. Sci. p. 231, 1935; Ito in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 262 & pl. IX, fig. 5, 1922; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 79, 1933; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 162, 1930; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

On *Veratrum album* L. var. *grandiflorum* Maxim. (*Baikeisô*). *S. Saghalien*:- Kaidzuka; Mt. Tosso; Kushunnai; Maoka; Mt. Nupuripo; Mt. Kashipo; Chikahoro; Higashi-Taraika; Shisuka. *Hokkaidô*:- Prov. Kitami: Momoiwa (*Rebun*). Prov. Kushiro: Kushiro; Nusamai; Kutcharo; Mt. Meakan-dake. Prov. Nemuro: Nemuro; Ochiishi-saki. Prov. Ishikari: Sôunkei. Prov. Tokachi: Pankenikoro (*Kuttari*); Kuttari-mura. *Kuriles*:- Kunashiri. *Honshû*:- Prov. Uzen: Mt. Gassan. Prov. Ugo: Hachimantai. Prov. Shimotsuke: *Nikkô*; Mt. Nyôhō;

Nyôhō; Mt. Shirane (*Nikkô*). Prov. Echigo: Tagami-mura. Prov. Shinano: Mt. Tsubakuro-dake; Mt. Komagatake (*Kiso*). Prov. Inaba: Mt. Nagisan. *Shikoku*:- Prov. Tosa: Tebako-yama. Prov. Iyo: Omogō-kei. *Kiushû*:- Prov. Hiuga: Mt. Ichibusa.

On *Veratrum stamineum* Maxim. (*Ko-baikeisô*). Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake.

On *Veratrum* sp. *Korea*:- Prov. Kannan: Tôjyômen.

11. **Uromyces yatsugatakense** Hiratsuka, f., l. c. p. 147.

On *Hedysarum elongatum* Fisch. var. *albiflorum* Ledeb. (*Iwa-ôgi*). *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake.

12. **Puccinia alpina** Fuckel (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 219, 220 & 237, 1931; IV, p. 35, 1932; Jour. Jap. Bot. X, p. 1, 1934; Bot. & Zool. II, p. 543 & 544, 1934; Sydow in Ann. Myc. XI, p. 101, 1913).

On *Viola biflora* L. (*Kibana-no-komanotsume*). *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Komagatake (*Kiso*).

On *Viola vaginaga* L. (*Sumire-saishin*). *Hokkaidô*:- Prov. Ishikari: Sapporo; Makomanai. Prov. Iburri: Mt. Makkari-nupuri. *Honshû*:- Prov. Rikuchû: Mt. Yakeishi-dake. Prov. Shimotsuke: Mt. Shirane (*Nikkô*). Prov. Shinano: Mt. Tsubakuro-dake; Nakabusa-onsen; Mt. Komagatake (*Kiso*). Prov. Hôki: Mt. Daisen. Prov. Inaba: Amedaki (*Ôkaya-mura*); Mt. Hyônosen; Mt. Ôginosen.

13. **Puccinia asiatica** (Kom.) Sydow (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 219 & 237, 1931; Sydow in Ann. Myc. XI, p. 100, 1913; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 21, 1934).

On *Tiarella polyphylla* D. Don. (*Zudayakushu*). *Hokkaidô*:- Prov. Ishikari: Sôunkei; Nopporo; Garugawa; Mt. Teine; Mt. Sapporo-dake; Jôzankei. Prov. Iburri: Lake-side of Shikotsu-ko; Chitose; Mt. Tarumae. *Honshû*:- Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake; Mt. Hayachine. Prov. Shinano: Mt. Tsubakuro-dake; Mt. Yatsugatake.

14. **Puccinia Bistortae** de Candolle (Dietel in Ann. Myc. V, p. 73, 1907; Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (6), 1929; Mem. Tottori Agric. Coll. I, p. 72, 1930; Bot. & Zool. II, p. 545, 1934; Togashi in Jap. Jour. Bot. II, p. 85, 1924).

On *Bistorta vivipara* S. F. Gray (*Mukago-toranoo*). *S. Saghalien*:- Mt. Tosso. *Kuriles*:- Urup: Tokotan. Shimushir: Kamoi-zaki (Broughton-wan). *Honshû*:- Prov. Rikuchû: Mt. Yakeishi-dake. Prov. Shimotsuke: Mt. Shirane (Nikkô). Prov. Shinano: Mt. Tsubakuro-dake; Mt. Arakawa-dake.

On *Bistorta vulgaris* Hill. (*Polygonum Bistorta* L.) (*Ibuki-toranoo*). *Shikoku*:- Prov. Awa: Mt. Tsurugi. *Kiushû*:- Prov. Bungo: Mt. Gôtôzan; Mt. Waitazan.

On *Bistorta vulgaris* Hill. var. *pacifica* Miyabe (*Polygonum pacificum* v. Petrov) (*Amime-ibuki-toranoo*). *Hokkaidô*:- Prov. Kitami: Momoiwa (Rebun).

15. ***Puccinia calthaecola*** Schröter (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 71, 1930; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 232, 1931). Syn. *Puccinia Zopfii* Wint. (Ito in Miyabe-Festschrift, p. (61), 1911; Sydow in Ann. Myc. XI, p. 99, 1913; Togashi in Jap. Jour. Bot. II, p. 91, 1924).

On *Caltha palustris* L. var. *typica* Rgl. (*Yezo-riukinkwa*). *S. Saghalien*:- Konuma; Kushunnai, Naibuchi; Higashi-Shiraure; Takinosawa (Noboripo); Mt. Tosso. *Hokkaidô*:- Prov. Oshima: Taniyoshi. Prov. Kitami: Tomochi (Rebun); Mt. Rishiri. Prov. Ishikari: Hokkai-zawa (Daisetsuzan).

On *Caltha palustris* L. var. *sibirica* Rgl. f. *decumbens* Mak. (*Enkôsô*). *Honshû*:- Prov. Rikuchû: Hirakasa.

16. ***Puccinia calumnata*** Sydow in Ann. Myc. XI, p. 102, 1913, (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 227, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (6), 1929; Mem. Tottori Agric. Coll. I, p. 72, 1930; Bot. & Zool. II, p. 543 & 545, 1934; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 232, 1931; Togashi in Jap. Jour. Bot. II, p. 85, 1924). Syn. *Puccinia monticola* (not Komarov) (Hara in Shidzuokaken-Nôkai-hô, XXXIV, no. 10, p. 59 & fig. 6, 1930). *Puccinia mamillata* (not Schröt.) (Kawakami in Bot. Mag. Tokyo, XIV, p. (106), 1900).

On *Pleuropteropyrum Savatieri* Koidz. (*Iwa-tade*). *Kuriles*:- Shimushir: Shimushir-wan. *Honshû*:- Prov. Shinano: Mt. Komagatake (Kiso). Prov. Suruga: Mt. Akaishi.

On *Pleuropteropyrum Weyrichii* H. Gross. (*Urajiro-tade*). *S. Saghalien*:- Mt. Shiritori; Mt. Tosso; Manui; Takinosawa (Noboripo).

Hokkaidô:- Prov. Kushiro: Mt. Meakan-dake.

On *Pleuropteropyrum Weyrichii* var. *alpicolum* Koidz. (*Takane-uraji-ro-tade*). *Hokkaidô*:- Prov. Kitami: Mt. Rishiri (*type!*). Prov. Ishikari: Mt. Kuro-dake; Hokkai-zawa (Daisetsuzan). *Honshû*:- Prov. Shinano: Mt. Tsubakuro-dake.

17. ***Puccinia Campanulae*** Carmichael (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 227, 1927; Transact. Tottori Soc. Agric. Sci. III, p. 215, 216 & 232, 1931; Bot. & Zool. II, p. 543 & 545, 1934).

On *Campanula lasiocarpa* Cham. (*Iwa-gikyô*). *Hokkaidô*:- Prov. Ishikari: Mt. Ushiro-asahi-dake; Hakuun-zawa (Daisetsuzan). Prov. Kushiro: Mt. Oakan-dake. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

18. ***Puccinia Circaeae*** Persoon (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 228, 1927; Mem. Tottori Agric. Coll. I, p. 70, 1930; Transact. Tottori Soc. Sci. III, p. 215, 216, 217, 219 & 236, 1931; Bot. & Zool. II, p. 545, 1934; Jour. Jap. Bot. X, p. 1, 1934; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 233, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 160, 1930; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 21, 1934).

On *Circaea alpina* L. (*Miyama-tanitade*). *S. Saghalien*:- Akashiki; Kita-Nayoshi; Mt. Kashipo; Shiritori; Mt. Nupuripo; Mt. Shiritori; Kashipo. *Hokkaidô*:- Prov. Ishikari: Mt. Sapporo-dake; Mt. Teine; Sôunkei; Mt. Kuro-dake. Prov. Kitami: Mt. Rishiri; Momoiwa (Rebun). Prov. Kushiro: Lake-side of Akan; Mt. Meakan-dake; Mt. Oakan-dake. *Honshû*:- Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Tsubakuro-dake.

On *Circaea erubescens* Franch. et Sav. (*Tanitade*). *Hokkaidô*:- Prov. Shiribeshi: Zenibako-tôge. Prov. Ishikari: Jôzankei.

19. ***Puccinia cuneata*** Dietel in Ann. Myc. IV, p. 304, 1906. (Dietel in Ann. Myc. V, p. 74, 1907; Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 219 & 237, 1931; Bot. & Zool. II, p. 545, 1934).

On *Geranium yezoense* Franch. et Sav. var. *nipponicum* Nakai (*Hakusan-fûro*). *Honshû*:- Prov. Shimotsuke: Mt. Shirane (*type!*). Prov. Shinano: Mt. Tsubakuro-dake. Prov. Rikuchû: Mt. Yakeishi-dake.

20. ***Puccinia Epilobii*** de Candolle (Hiratsuka, f. in Ann. Myc.

XXVIII, p. 278, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 217 & 236, 1931; Bot. & Zool. II, p. 545, 1934).

On *Epilobium Hornemanii* Rehb. (*Yezo-miyama-akabana*). Hokkaidô: Prov. Ishikari: Hokkai-sawa (Daisetsuzan).

21. ***Puccinia Fergussoni*** Berkeley et Broome (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 70, 1931; Transact. Tottori Soc. Agric. Sci. III, p. 217 & 237, 1931; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 246, 1927).

On *Viola Selkirkii* Pursh. (*Miyama-sumire*). *S. Saghalien*: Mt. Kashiwa. Honshû: Prov. Mutsu: Mt. Hakkôda. Prov. Ugo: Mt. Komagatake.

22. ***Puccinia ferruginosa*** Sydow, Mongr. Ured. I, p. 13 & pl. I, fig. 10, 1902. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 228, 1927; Transact. Tottori Soc. Agric. Sci. II, p. 234, 1931; III, p. 215, 217, 218, 220 & 230, 1931; IV, p. 33, 1932; Bot. Mag. Tokyo, XLIX, p. 146, 1935; Jour. Jap. Bot. XI, p. 39, 1935; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 266, 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 233, 1931; Sydow in Ann. Myc. XI, p. 95, 1913; Togashi in Jap. Jour. Bot. II, p. 86, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 22, 1934).

This species is widely distributed throughout this country on the following species of *Artemisia*; *Artemisia desertorum* Spreng. (*Hamaotoko-yomogi*) (Hokkaidô), *A. japonica* Thumb. (*Otoko-yomogi*) (Hokkaidô and Honshû), *A. vulgaris* L. var. *coarctata* Bess. (*Hosoba-yezo-yomogi*) (*S. Saghalien* and Korea), *A. vulgaris* L. var. *kamtschatica* Bess. (*Yezo-yomogi*) (*S. Saghalien* and Hokkaidô), *A. vulgaris* L. var. *indica* Maxim. (*Yomogi*) (Honshû, Shikoku, Kiushû and Korea), *A. vulgaris* L. var. *integriifolia* Ledeb. (*Hitotsuba-yomogi*) (Honshû), *A. vulgaris* L. var. *latiloba* Ledeb. (*Hiroha-urajiro-yomogi*) (*S. Saghalien*) and *A. vulgaris* L. var. *vulgatissima* Bess. (*Yama-yomogi*) (Honshû).

23. ***Puccinia Funkiae*** Dietel in Hedwigia XXXVII, p. 214, 1898. (Dietel in Ann. Myc. VIII, p. 305, 1910; Hennings in Engl. Bot. Jahrb. XXVIII, p. 261, 1900; XXXII, p. 35, 1902; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 229, 1927; Transact. Tottori Soc. Agric. Sci. IV, p. 35, 1932; Bot. Mag. Tokyo, XLIX, p. 147, 1935; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr.

Sapporo, XIX, (no. 85), p. (76), 1927; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 263, 1927; Sydow in Ann. Myc. XI, p. 102, 1913; Togashi & Onuma in Bull. Coll. Agric. & Forestr. Morioka, XVII, p. 22, 1934; Yoshinaga in Bot. Mag. Tokyo, XV, p. (96), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 640, 1930). Syn. *Uredo Hostae* Hennings in Monsunia I, p. 3, 1899. *Puccinia Hostae* Hara in Shidzuoka-ken-Nôkai-hô, XXXIV, no. 10, p. 58 & fig. 5, 1930.

On *Hosta japonica* Aschers. et Graebn. & its varieties (*Koba-giboshi*, *Giboshi*, *Midzu-giboshi*). Hokkaidô (*Ishikari*, *Iburi*, *Kushiro*, *Oshima*). Honshû (*Mutsu*, *Rikuchû*, *Musashi*, *Shimotsuke*). Shikoku (*Tosa*).

On *Hosta minor* Nakai (*Ko-giboshi*). Korea (*Kôgen*).

On *Hosta Sieboldiana* Engl. & its varieties (*Tô-giboshi*, *Iwa-giboshi*). Honshû (*Mutsu*, *Ugo*, *Rikuchû*, *Suruga*, *Shinano*, *Inaba*, *Hôki*).

On *Hosta plantaginea* Aschers. (*Tamano-kanzashi*). Shikoku (*Tosa*).

24. ***Puccinia Gymnandrae*** Tranzschel (Hara in Jour. Jap. Hort. Soc. XXVIII, no. 7, p. 8 & text-fig., 1916).

On *Lagotis glauca* Gaertn. (*Urappu-sô*). Honshû: Prov. Shinano: Mt. Shirouma-dake. This fungus has been collected only in Mt. Shirouma-dake in our country.

25. ***Puccinia Hieracii*** (Schum.) Martius (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 229, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (4), 1929; Mem. Tottori Agric. Coll. I, p. 67, 1930; Bot. & Zool. II, p. 543, 1934; Hiratsuka, f. & Hashioka in Bot. Mag. Tokyo, XLIX, p. 521, 1935; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (77), 1928; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 233, 1931; Sydow in Ann. Myc. XI, p. 96, 1913). Syn. *Puccinia Picridis* Hazsl. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 103, 1905; Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 230, 1927; Transact. Tottori Soc. Agric. Sci. II, p. 234, 1931; IV, p. 33, 1932; Jour. Jap. Bot. XI, p. 40, 1935; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (77), 1928; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 234, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 81, 1933; Sydow in Ann. Myc. XI, p. 97, 1913; Togashi in Jap. Jour. Bot. II, p. 89, 1924; Togashi & Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sap-

poro, XVI, p. 78, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 24, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

On *Hieracium japonicum* Franch. et Sav. (*Miyama-kôzorina*). Honshû:- Prov. Shinano: Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

On *Hieracium umbellatum* L. (*Yanagi-tampopo*). (*S. Saghalien, Hokkaidô, Kuriles and Honshû*).

On *Picris hieracioides* L. var. *japonica* Rgl. (*Kôzorina*). (*S. Saghalien, Hokkaidô, Kuriles, Honshû, Shikoku, Kiushû and Korea*).

On *Picris morrisonensis* Hayata (*Niitaka-kôzorina*) (*Formosa*).

26. **Puccinia Hultenii** Tranzschel et Jørstad (Hiratsuka, f. in Jour. Jap. Bot. X, p. 620 & fig. 16, 1935). Syn. *Puccinia Rumicis-scutati* (not Wint.) (Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930; Bot. & Zool. II, p. 545, 1934; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 82, 1933).

On *Rumex Acetosa* L. var. *alpina* Hartm. (*Chishima-suiba*). Kuriles:- Kunashiri: Furukamappu; Uennai; Shiranuka. Etorofu: Shana.

On *Rumex arifolius* All. (*Takane-suiba*). Hokkaidô:- Prov. Ishikari: Mt. Kuro-dake.

27. **Puccinia iwateyamensis** Hiratsuka, f., l. c. p. 140.

On *Pleuropterypyrum Nakaii* Hara (*Oyama-soba*). Honshû:- Prov. Rikuchû: Mt. Iwate (*type!*); Mt. Sukawa-dake.

28. **Puccinia Lactucae** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Dietel in Engl. Bot. Jahrb. XXXIV, p. 586, 1905; XXXVII, p. 103, 1905; Ann. Myc. VIII, p. 310, 1910, p. p.; Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902, p. p.; XXXII, p. 26, 1902; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 229, 1927; Transact. Tottori Soc. Agric. Sci. IV, p. 33, 1932; Bot. & Zool. II, p. 543, 1934; Jour. Jap. Bot. XI, p. 40, 1935; Sydow in Ann. Myc. XI, p. 96, 1913; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 23, 1934; Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930; Yoshino in Bot. Mag. Tokyo, XIX, p. (98), 1905, p. p.).

On *Lactuca alpicola* Nakai (*Takane-nigana*). Honshû:- Prov. Shinano: Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

On *Lactuca dentata* Mak. var. *albiflora* Mak. (*Shirobana-nigana*) (*Hokkaidô, Honshû and Shikoku*).

On *Lactuca dentata* Mak. var. *Thunbergii* Mak. (*Nigana*) (*Hokkaidô, Honshû, Shikoku, Kiushû, Korea and Formosa*).

On *Lactuca stolonifera* Benth. et. Hook. f. (*Iwa-nigana*) (*Hokkaidô and Honshû*).

29. **Puccinia Majanthemi** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 229, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (6), 1929; Mem. Tottori Agric. Coll. I, p. 73, 1930; Ann. Myc. XXVIII, p. 279, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215, 216, 217, 218, 219, 220 & 241, 1931; IV, p. 35, 1932; Bot. & Zool. II, p. 543, 544 & 545, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 263, 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 234, 1931; Kusano in Bot. Mag. Tokyo, XVIII, p. (198), 1904; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 81, 1933; Sydow in Ann. Myc. XI, p. 103, 1913; Togashi in Jap. Jour. Bot. II, p. 88, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 23, 1934).

On *Convallaria majalis* L. (*Kimikagesô*). *S. Saghalien*:- Ôdomari. Hokkaidô:- Prov. Tokachi: Urimaku; Lake-side of Shikaribetsu-numa.

On *Disporum smilacinum* A. Gray (*Chigo-yuri*). Honshû:- Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake.

On *Hosta Sieboldiana* Engl. var. *longipes* Matsum. (*Iwa-giboshi*). Honshû:- Prov. Shinano: Nakabusa-onsen.

On *Majanthemum dilatatum* Nels. et Macbr. (*Maidzurusô*). *S. Saghalien*:- Konuma; Ôdomari; Shisuka; Aihama; Mt. Tosso; Higashi-Tarai-ika; Tominai; Kita-Nayoshi. Hokkaidô:- Prov. Oshima: Ônuma. Prov. Iburi: Mt. Makkari-nupuri. Prov. Ishikari: Mt. Teine; Mt. Saoro; Mt. Kuro-dake; Mt. Numagahara; Upper part of Rûomansorapuchi-gawa; Ochiai. Prov. Teshio: Horonobe-mura. Prov. Tokachi: Lake-side of Shikaribetsu-numa. Prov. Kitami: Kitami-aioi; Momiwa (Rebun); Mt. Rishiri. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake; Chûrui-moshiri (Akan); Bokke (Akan). Prov. Nemuro: Nemuro; Ochii-shi-saki; Tomoshiri. Kuriles:- Urup: Kobune-minato; Tokotan. Nemo-shiri: Onnekotan. Shikotan: Shakotan. Kunashiri: Furukamappu to Nikishiro; Uennai. Etorofu: Shana. Shumushu. Honshû:- Prov. Mutsu: Mt. Hakkôda; Mt. Iwaki. Prov. Rikuchû: Mt. Iwate; Mt. Sukawa-dake; Mt. Hayachine. Prov. Ugo: Mt. Komagatake; Sengan-tôge;

Mt. Mahiru. Prov. Shinano: Mt. Shirouma-dake; Mt. Komagatake (Kiso); Mt. Tsubakuro-dake; Mt. Yatsugatake. Prov. Etchû: Minakoshi. Prov. Echigo: Mt. Ninôji. Prov. Shimotsuke: Mt. Shirane (Nikkô) (*type!*).

On *Smilacina davurica* Turcz. (*Karafuto-yukizasa*). *S. Saghalien*:-Shisuka.

On *Smilacina japonica* A. Gray (*Yukizasa*). *Honshû*:- Prov. Hôki: Mt. Daisen.

On *Trillium kamtschaticum* Pall. (*Obana-no-enreisô*). *S. Saghalien*:- Mt. Suzuya. *Hokkaidô*:- Prov. Tokachi: Lake-side of Shikaribetsu-numa.

On *Trillium Tschonoskii* Maxim. (*Miyama-enreisô*, *Shirobana-enreisô*). *Hokkaidô*:- Prov. Kushiro: Mt. Meakan-dake.

30. ***Puccinia melanoplaca*** Sydow in Ann. Myc. VII, p. 168, 1909. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218, 219 & 232, 1931; Bot. & Zool. II, p. 543, 544 & 545, 1934; Togashi in Bull. Imp. Coll. Agric. & Forestr. Morioka, IX, p. 22 & text-fig. 3, 1926). Syn. *Puccinia Patriniae-gibbosae* Miura in Sydow in Ann. Myc. XI, p. 100 & fig. 3, 1913.

On *Patrinia gibbosa* Maxim. (*Maruba-kinreikwa*). *Hokkaidô*:- Prov. Oshima: Mt. Komagatake. Prov. Teshio: Otoineppu. *Honshû*:- Prov. Mutsu: Mt. Iwaki (*type* of *Puccinia Patriniae-gibbosae* Miura). Prov. Rikuchû: Mt. Sukawa-dake; Mt. Yakeishi-dake; Mt. Iwate. Prov. Ugo: Mt. Chôkai; Mt. Komagatake; Sengan-tôge.

On *Patrinia triloba* Matsum. (*Hakusan-ominaeshi*). *Honshû*:- Prov. Suruga: Mt. Fuji. Prov. Shinano: Mt. Yatsugatake; Mt. Komagatake (Kiso); Mt. Kurohime (*type!*); Mt. Tsubakuro-dake. Prov. Etchû Kurobe.

31. ***Puccinia melasmoides*** Tranzschel (Ito in Miyabe-Festschrift, p. (60), 1911).

On *Aquilegia akitensis* Huth. (*Miyama-odamaki*). *Honshû*:- Prov. Shinano: Mt. Shirouma-dake.

32. ***Puccinia Metanarthecei*** Patouillard in Rev. Myc. (1886), p. 80, 1886. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 99, 1905; Hennings in Monsonia I, p. 2, 1899; Engl. Bot. Jahrb. XXXII, p. 35, 1902; Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. IV, p. 35, 1932; Jour. Jap. Bot. XI, p. 40, 1935; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (77), 1927;

Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 263, 1927; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 23, 1934; Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 641, 1930).

On *Aletris foliata* Franch. (*Nebari-nogiran*). *Hokkaidô*:- Prov. Ishikari: Horomui; Tsuishikari. Prov. Tokachi: Shintoku. *Honshû*:- Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Hayachine; Mt. Iwate. Prov. Shimotsuke: Nikkô. Prov. Suruga: Mt. Fuji. Prov. Hôki: Mt. Daisen.

On *Metanartheceum luteo-viride* Maxim. (*Nogiran*). *Honshû*:- Prov. Mutsu: Mt. Iwaki. Prov. Uzen: Komatsu. Prov. Rikuchû: Gomyôjin; Yumoto-mura; Mt. Sukawa-dake; Mt. Yakeishi-dake. Prov. Shimotsuke: Nikkô. Prov. Echigo: Niigata (*type!*); Mt. Ninôji. Prov. Iwashiro: Handa-mura. Prov. Inaba: Inaba-mura; Tottori; Hôgi-mura; Mt. Hyônosen. Prov. Hôki: Daisen-mura; Mt. Daisen. Prov. Idzumo: Kijima-mura. *Shikoku*:- Prov. Tosa: Sakawa-machi; Mt. Yokogura; Kajigamori. Prov. Iyo: Ônogahara. *Kiushû*:- Prov. Bungo: Mt. Kuju. Prov. Ôsumi: Mt. Takakuma.

33. ***Puccinia Nanbuana*** Hennings in Hedwigia XL, p. (26), 1901. (Hiratsuka, f. in Jour. Jap. Bot. XI, p. 278, 1935; Lindroth in Acta Soc. pro Fauna et Flora Fennica, XX, no. 1, p. 93, 1902; T. Miyake in Jour. Sapporo Agric. Coll. II, p. 117 & pl. III, fig. 4, 1906; Nambu in Bot. Mag. Tokyo, XVIII, p. (1), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930). Syn. *Puccinia Angelicae-edulis* T. Miyake in Jour. Sapporo Agric. Coll. II, p. 111 & pl. III, fig. 6, 1906. (Dietel in Ann. Myc. VIII, p. 310, 1910; Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 69, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 34, 1932; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 231, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 79, 1933; Sydow in Ann. Myc. XI, p. 99, 1913; Togashi in Jap. Jour. Bot. II, p. 84, 1927; Togashi & Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XVI, p. 77, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 19, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930). *Puccinia bullata* (not Schrôt.) (Dietel in Engl. Bot. Jahrb. XXXII, p. 35, 1902; Kusano in Bot. Mag. Tokyo, XVI, p. (199), 1902; Yoshina-

ga in Bot. Mag. Tokyo, XV, p. (96), 1901). *Puccinia Angelicae* (not Fuck.) (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (33), 1904). While studying Puccinias on the Japanese *Umbelliferae*, the writer found that, while there was some variation in the collections on different hosts, there was no sharp distinction between *Puccinia Nanbuana* and *P. Angelicae-edulis*. This species is widely distributed throughout our country, on the following hosts; *Angelica edulis* Miyabe (*Hama-niu*) (*Hokkaidô*, *Kuriles*, *S. Saghalien* and *Honshû*), *A. inaequalis* Maxim. (*Hanabi-zeri*) (*Shikoku*), *A. kiusiana* Maxim. (*Oni-udo*) (*Shikoku*), *A. polyclada* Franch. (*Shishiu-udo*) (*Honshû*), *A. shikokiana* Mak. (*Inu-tôki*) (*Shikoku*), *A. Yoshinagae* Mak. (*Tosa-bôfû*) (*Shikoku*), *A. ursina* Maxim. (*Yezo-niu*) (*S. Saghalien*, *Hokkaidô* and *Honshû*), *Coelopleurum Gmelini* Ledeb. (*Hama-udo*) (*S. Saghalien* and *Hokkaidô*), *Peucedanum decursivum* Maxim. (*Nodake*) (*Honshû* and *Shikoku*) and *P. multivittatum* Maxim. (*Hakusan-bôfû*) [*Hokkaidô*: Prov. Ishikari: Mt. Ushiro-asahi. *Honshû*: Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Komagatake (Kiso)].

34. *Puccinia nitidula* Tranzschel (Hiratsuka, f., l. c. p. 141).

On *Pleuroteropyrum Nakaii* Hara (*Oyama-soba*). *Honshû*: Prov. Rikuchû: Mt. Iwate.

35. *Puccinia pachycephala* Dietel in Ann. Myc. IV, p. 305, 1906. (Dietel in Ann. Myc. V, p. 71, 1907; Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. IV, p. 35, 1932; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 23, 1934).

On *Veratrum Maximowiczii* Bak. (*Aoyagisô*). *Honshû*: Prov. Rikuchû: Mt. Hayachine; Mt. Iwate. Prov. Shimotsuke: Urami (Nikkô) (*type!*). Prov. Echigo: Mt. Ninôji.

On *Veratrum nigrum* L. var. *japonicum* Bak. (*Shurosô*). *Hokkaidô*: Prov. Oshima: Zenikame-zawa. Prov. Tokachi: Shintoku. *Honshû*: Prov. Rikuzen: Kawahari-mura. Prov. Hôki: Mt. Daisen. *Shikoku*: Prov. Iyo: Ônogahara.

36. *Puccinia Polygoni-Weyrichii* T. Miyake in Kawai & Ota-ni in Transact. Sapporo Nat. Hist. Soc. XI, p. 234 & fig. 1, 1931. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 238, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 82, 1933).

On *Pleuroteropyrum Savatieri* Koidz. (*Iwa-tade*). *Kuriles*: Urup: To-

kotan. Kunashiri: Sainokawara to Shiranuka.

On *Pleuroteropyrum Weyrichii* H. Gross. (*Urajiro-tade*) *S. Saghalien*: Mt. Kashipo; Odasan; Shiritori.

On *Pleuroteropyrum Weyrichii* var. *alpicolum* Koidz. (*Takane-urajiro-tade*). *Honshû*: Prov. Shinano: Mt. Tsubakuro-dake.

37. *Puccinia porphyrogentia* Curtis (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (5), 1929; Mem. Tottori Agric. Coll. I, p. 68, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215, 216, 217, 218, 219 & 236, 1931; Bot. & Zool. II, p. 543, 544 & 545, 1934; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 82, 1933). Syn. *Puccinia acuminata* Peck (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 226, 1927).

On *Chamaepericlymenum canadense* Aschers. et Graebn. (*Gozen-tachibana*). *S. Saghalien*: Odasan; Mt. Tosso. *Hokkaidô*: Prov. Ishikari: Mt. Kuro-dake; Takanegahara (Daisetsuzan); Sôunkei; Ochiai; Shikagoe; Mt. Nisekaushipe. Prov. Kitami: Kitami-Aioi; Okedo-mura. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake; Shirikomabetsu (Akan); Teshikaga-mura. Prov. Tokachi: Sankenai; Shikaribetsu-numa; Mt. Nishi-Nupukaushi; Shii-tokachi-kawa. *Kuriles*: Kunashiri: Kuraoi; Furukamappu. Etorofu: Shibetoro. *Honshû*: Prov. Rikuchû: Mt. Yakeishi-dake. Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso). Prov. Echigo: Mt. Ninôji.

On *Chamaepericlymenum suecicum* Aschers. et Graebn. (*Cornus suecica* L.) (*Yezo-gozentachibana*). *Kuriles*: Urup: Tokotan.

38. *Puccinia Pulsatillae* Kalchbrenner (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 219 & 239, 1931; Bot. & Zool. II, p. 544, 1934).

On *Pulsatilla nipponica* Ohwi (*Tsukumogusa*). *Honshû*: Prov. Shinano: Mt. Yatsugatake.

39. *Puccinia rhytismoides* Johanson (Ito in Miyabe-Festschrift, p. (64), 1911).

On *Thalictrum alpinum* L. (*Hime-karamatsu*). *Honshû*: Prov. Shinano: Mt. Shirouma-dake.

On *Thalictrum tuberiferum* Maxim. (*Miyama-karamatsu*). *Honshû*: Prov. Echigo: Mt. Ninôji; Mt. Tohô.

40. *Puccinia Ribis-japonici* Hennings in Hedwigia XLI, p. (19), 1902. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III,

p. 219 & 239, 1931; Bot. & Zool. II, p. 544, 1934; Sydow in Ann. Myc. XI, p. 100, 1913).

On *Ribes japonicum* Maxim. (*Komagatake-suguri*). *Hokkaidô*:- Prov. Iburi: Mt. Makkari-nupuri. Prov. Ishikari: Jôzankei; Mt. Teine; Mt. Sapporo-dake. *Honshû*:- Prov. Shinano: Mt. Yatsugatake. *Shikoku*:- Prov. Iyo: Mt. Ishidzuchi (*type!*).

41. ***Puccinia Saxifragae*** Schlechtendal (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 231, 1927; Transact. Tottori Soc. Agric. Sci. II, p. 237, 1931; III, p. 216, 217, 219 & 238, 1931; IV, p. 35, 1932; Bot. & Zool. II, p. 543, 544 & 545, 1934; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 82, 1933; Sydow in Ann. Myc. XI, p. 100, 1913; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 24, 1934).

On *Saxifraga cortusaefolia* Sieb. et Zucc. var. *typica* Mak. (*Daimonjisô*). *Kuriles*:- Kunashiri: Uennai. *Honshû*:- Prov. Shinano: Mt. Komagatake (Kiso). Prov. Hôki: Mt. Daisen.

On *Saxifraga fusca* Maxim. (*Kurokumosô*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Kamikawa-mura; Mt. Moiwa near Sapporo; Mt. Teine; Ochiai; Sôunkei; Mt. Nisekaushipe. Prov. Iburi: Tomamu. Prov. Shiribeshi: Mt. Yoichi-dake. Prov. Tokachi: Horoka-tokachi; Pankenikoro (Kuttari). Prov. Kushiro: Mt. Meakan-dake; Yûbetsu. Prov. Kitami: Ponkikin. *Kuriles*:- Kunashiri: Nikishiro; Mt. Chachanupuri. *Honshû*:- Prov. Rikuchû: Mt. Sukawa-dake; Mt. Yakeishi-dake; Mt. Hayachine. Prov. Shinano: Mt. Komagatake (Kiso); Mt. Tsubakuro-dake.

On *Saxifraga punctata* L. (*Chishima-iwabuki*). *S. Saghalien*:- Noboripo.

42. ***Puccinia Schizocodonis*** Patouillard in Bull. Soc. Myc. France, III, p. 124, 1887. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 217, 218, 219 & 235, 1931; Bot. & Zool. II, p. 544 & 545, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 265, 1927).

On *Shortia soldanelloides* Mak. var. *genuina* Mak. (*Iwakagami*). *Honshû*:- Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake; Mt. Sukawa-dake. Prov. Ugo: Mt. Komagatake. Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

On *Shortia uniflora* Maxim. (*Iwa-uchiwa*). *Honshû*:- Prov. Echigo:

Mt. Ninôji.

43. ***Puccinia sibirica*** Tranzschel (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 238, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 161, 1930).

On *Pleuropteropyrum ajanense* Nakai var. *glabrescens* Miyabe (*Chishima-iwatade*). *S. Saghalien*:- Mt. Tosso; Mt. Kashipo.

On *Pleuropteropyrum ajanense* Nakai var. *pilosum* Miyabe (*Hosobaontade*). *Hokkaidô*:- Prov. Kitami: Momoiwa (Rebun).

44. ***Puccinia Togashiana*** Hiratsuka, f., l. c. p. 141.

On *Thalictrum tuberiferum* Maxim. (*Miyama-karamatsu*). *Honshû*:- Prov. Rikuchû: Mt. Iwate.

45. ***Puccinia Tokunagai*** Ito et Kawai in Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 236 & fig. 3, 1931. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 236, 1931).

On *Leontopodium sachalinense* Miyabe et Kudo (*Yezo-usuyukisô*). *S. Saghalien*:- Mt. Tosso (*type!*).

46. ***Puccinia Trautvetteriae*** Sydow et Holway (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 72, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215, 217, 220 & 239, 1931; Jour. Jap. Bot. X, p. 222, 1934; Bot. & Zool. II, p. 544 & 545, 1934; Ito in Miyabe-Festschrift, p. (65), 1911; Sydow in Ann. Myc. VII, p. 169, 1909; XI, p. 100, 1913). Syn. *Puccinia melasmoides* (not Tranzschel) (Hara in Shidzuoka-Ken-Nôkai-hô, XXXIV, no. 10, p. 61 & fig. 10, 1930).

On *Trautvetteria japonica* Sieb. et Zucc. (*Momiji-karamatsu*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Mt. Hakuun-dake; Sôunkei. *Honshû*:- Prov. Mutsu: Mt. Iwaki. Prov. Rikuchû: Mt. Yakeishi-dake; Mt. Sukawa-dake; Mt. Iwate. Prov. Ugo: Mt. Komagatake; Mt. Mahiru; Mt. Gassan. Prov. Echigo: Mt. Myôkô; Mt. Ninôji; Mt. Iide. Prov. Etchû: Minakoshi. Prov. Shinano: Mt. Komagatake (Kiso); Mt. Tsubakuro-dake. Prov. Suruga: Mt. Akaishi.

On *Trautvetteria japonica* Sieb. et Zucc. var. *borealis* Hara (*Okumomiji-karamatsu*). *S. Saghalien*:- Mt. Nupuripo.

47. ***Puccinia Veronicarum*** de Candolle (Hiratsuka, f. in Ann. Myc. XXVIII, p. 278, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 217, 220 & 234, 1931; IV, p. 34, 1932; Bot. & Zool. II, p. 545, 1934).



On *Veronica morrisonicola* Hayata (*Niitaka-kuwagata*). *Formosa*: Prov. Shinchiku: Mt. Taiha.

On *Veronica sibirica* L. (*Yezo-no-kugaisô*). *Hokkaidô*: Prov. Ishikari: Jôzankei.

On *Veronica yezoensis* Nakai (*Miyama-kuwagata*). *Hokkaidô*: Prov. Ishikari: Kumonotaira (*Daisetsuzan*); Daifunkawakô (*Daisetsuzan*).

On *Veronica virginica* L. var. *japonica* Nakai (*Kugaisô*). *Honshû*: Prov. Hôki: Mt. Daisen. *Shikoku*: Prov. Iyo: Mt. Higashi-Akaishi.

48. ***Puccinia vesiculosa*** Schlechtendal (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 72, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215, 217, 219, 220 & 239, 1931; Bot. & Zool. II, p. 544 & 545, 1934; Ito in Miyabe-Festschrift, p. (58), 1911; Togashi in Jap. Jour. Bot. II, p. 90, 1924). Syn. *Puccinia Schelliana* (not Thüm.) (Kawakami in Bot. Mag. Tokyo, XIV, p. (106), 1900).

On *Anemone narcissiflora* L. (*Hakusan-ichige*). *Honshû*: Prov. Rikuchû: Mt. Yakeishi-dake. Prov. Suruga: Mt. Akaishi. Prov. Shinano: Mt. Tsubakuro-dake; Mt. Yatsugatake; Mt. Komagatake (*Kiso*).

On *Anemone narcissiflora* L. var. *sachalinensis* Miyabe et T. Miya-ke (*Yezo-no-hakusan-ichige*). *S. Saghalien*: Mt. Tosso. *Hokkaidô*: Prov. Ishikari: Mt. Hokkai-dake; Yukinosawa (*Daisetsuzan*); Mt. Kuro-dake; Mt. Hakuun-dake; Daifunkwa-kô (*Daisetsuzan*). Prov. Kitami: Mt. Rishiri.

49. ***Puccinia Violae*** (Schum.) de Candolle (Dietel in Engl. Bot. Jahrb. XXVIII, p. 284, 1900; Ann. Myc. VIII, p. 310, 1910; Fujikuro in Transact. Nat. Hist. Soc. Formosa, no. 19, p. 7, 1914; Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 231, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (6), 1929; Transact. Tottori Soc. Agric. Sci. II, p. 237, 1931; IV, p. 35, 1932; Jour. Jap. Bot. XI, p. 278, 1935; Bot. & Zool. II, p. 544 & 545, 1934; Hiratsuka, f. & Hashioka in Transact. Tottori Soc. Agric. Sci. IV, p. 159, 1933; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 237, 1931; Kusano in Bot. Mag. Tokyo, XVI, p. (198), 1902; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 83, 1933; Sawada, Descript. Cat. Formosan Fung. IV, p. 70, 1928; Sydow in Ann. Myc. XI, p. 101, 1913; Togashi in Jap. Jour. Bot. II, p. 90, 1924; Togashi & Hiratsuka, f. in Jour. Soc. Agric. & Forestr.

Sapporo, XVI, p. 78, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 26, 1934; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34) & (218), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930; Yoshino in Bot. Mag. Tokyo, XIX, p. (99), 1905).

This species is widely distributed throughout our country, on the following species of *Viola*; *Viola acuminata* Ledeb. (*Yezo-no-tachitsubo-sumire*) (*Hokkaidô* and *Kuriles*), *V. biflora* L. (*Kibana-no-komanotsume*) [*Honshû*: Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (*Kiso*)], *V. Boissieuana* Mak. (*Hime-miyama-sumire*) (*Shikoku*), *V. collina* Bess. (*Maruba-ke-sumire*) (*Hokkaidô* and *Honshû*), *V. grypoceras* A. Gray (*Tachitsubo-sumire*) (*Hokkaidô*, *Honshû*, *Shikoku* and *Kiushû*), *V. Langsdorffii* Fisch. (*Ôba-tachitsubo-sumire*) (*Hokkaidô* and *Kuriles*), *V. nipponica* Maxim. (*Aoi-sumire*) (*Honshû* and *Kiushû*), *V. mandshurica* W. Beck. var. *glabra* Nakai (*Sumire*) (*Honshû*, *Shikoku*, *Kiushû* and *Formosa*), *V. oblongo-sagittata* Nakai (*Taiwan-yanone-sumire*) (*Formosa*), *V. Patrini* DC. var. *typica* Maxim. (*Shirobana-sumire*) (*Hokkaidô* and *Honshû*), *V. ovato-oblonga* Mak. (*Nagaba-tachitsubo-sumire*) (*Shikoku* and *Kiushû*), *V. rupicola* Elm. (*Arage-sumire*) (*Formosa*), *V. Selkirkii* Pursh. (*Miyama-sumire*) (*Honshû*), *V. sylvestrifomis* W. Beck. (*Ainu-tachitsubo-sumire*) (*S. Saghalien*) and *V. tozanensis* Hayata (*Tôzan-sumire*) (*Formosa*).

50. ***Puccinia Violae-glabellae*** Miura in Sydow in Ann. Myc. XI, p. 101 & fig. 4, 1913. (Hiratsuka, f. in Bot. & Zool. II, p. 545, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 264, 1927; Sydow in Ann. Myc. XII, p. 159, 1914).

On *Viola brevistipulata* W. Beck. (*Viola glabella* Nutt.) (*Ôba-ki-sumire*). *Hokkaidô*: Prov. Ishikari: Upper part of Rûoman-sorapuchi-kawa. *Honshû*: Prov. Mutsu: Mt. Iwaki (*type!*); Mt. Hakkôda. Prov. Rikuchû: Mt. Iwate; Mt. Sukawa-dake. Prov. Ugo: Mt. Komagatake. Prov. Shinano: Mt. Tsubakuro-dake.

On *Viola crassa* Mak. (*Takane-sumire*). *Hokkaidô*: Prov. Ishikari: Mt. Hokkai-dake. *Honshû*: Prov. Rikuchû: Mt. Iwate.

51. ***Puccinia Virgaureae*** (DC.) Libert (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 232, 1927; Sydow in Ann. Myc. XI, p. 98, 1913). Syn. *Puccinia Virgaureae* Corda (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 68, 1930; Transact. Tottori Soc. Agric. Sci. III, p. 215 & 231, 1931; Jour. Jap. Bot. X, p. 3, 1934).

On *Solidago Virgaurea* L. (*Akinokirinsô*). *S. Saghalien*:- Manui. *Hokkaidô*:- Prov. Ishikari: Sapporo. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

52. ***Puccinia vomica*** Thümen (Dietel in Ann. Myc. V, p. 74, 1907; Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 218 & 231, 1931).

On *Saussurea kai-montana* Takeda form. *major* Takeda (*Miyama-higotai*). *Honshû*:- Prov. Shinano: Mt. Yatsugatake.

On *Saussurea Tanakae* Franch. et Sav. var. *phyllolepis* Maxim. (*Ô-tôhiren*). *Honshû*:- Prov. Shimotsuke: Mt. Shirane (Nikkô).

53. ***Phragmidium alpinum*** Hiratsuka, f. in Ann. Myc. XXVIII, p. 280, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 242, 1931; III, p. 215, 217, 219 & 243, 1931; Bot. & Zool. II, p. 544, 545 & fig. 5, 1934; Jap. Jour. Bot. VII, p. 243, text-fig. 3 & pl. III, fig. 2, 1935).

On *Rubus pedatus* Sm. (*Kogane-ichigo*). *S. Saghalien*:- Mt. Tosso. *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Mt. Nisekaushipe. Prov. Iburi: Tomamu. *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

54. ***Phragmidium fusiforme*** Schröter (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 252, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 31 & pl. I, fig. 3, 1910). Syn. *Phragmidium Rosae-acicularis* Liro (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 76, 1930; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 231, 1931).

On *Rosa acicularis* Lindl. var. *Gmelini* C. K. Schneid. (*Ô-takanebara*). *S. Saghalien*:- Toyohara; Kashipo; Horo; Mt. Shiritori. *Hokkaidô*:- Prov. Iburi: Mukawa. Prov. Tokachi: Shikaribetsu-numa; Kuttari. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake.

55. ***Phragmidium Itoanum*** Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. XIII, p. 134, 1934. (Hiratsuka, f. in Bot. & Zool. II, p. 544 & 545, 1934; Jap. Jour. Bot. VII, p. 270 & pl. IV, figs. 3 & 6, 1935).

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). *Hokkaidô*:- Prov. Iburi: Mt. Makkari-nupuri. Prov. Ishikari: Mt. Hokkai-dake; Kumonotaira (Daisetsuzan); Mt. Hakuun-dake; Hokkai-sawa (Daisetsuzan) (*type!*); Mt. Tomuraushi. *Kuriles*:- Shikotan. *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

56. ***Phragmidium Miyabeanum*** Ito et Hiratsuka, f. in Hiratsuka, f. in Ann. Myc. XXVIII, p. 279, 1930. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 242, 1931; III, p. 215, 217, 220, 221 & 243, 1931; Bot. & Zool. II, p. 544, 545 & 546, 1934; Jap. Jour. Bot. VII, p. 258, 1935).

On *Sieversia pentapetala* Greene (*Chinguruma*). *S. Saghalien*:- Mt. Tosso; Mt. Nupuripo. *Hokkaidô*:- Prov. Ishikari: Kumonotaira (Daisetsuzan); Mt. Kuro-dake (*type!*); Mt. Kaun-dake; Mt. Tomuraushi; Mt. Hokkai-dake. *Honshû*:- Prov. Rikuchû: Mt. Yakeishi-dake. Prov. Shinano: Mt. Tsubakuro-dake; Mt. Komagatake (Kiso).

57. ***Phragmidium Potentillae*** (Pers.) Karsten (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905, p. p.; Hiratsuka, f. in Jap. Jour. Bot. VII, p. 262 & pl. IV, figs. 1 & 4, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 29, 1910, p. p.; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 19, 1934).

On *Potentilla chinensis* Ser. (*Kawara-saiko*). *Honshû*:- Prov. Rikuzen: Ishinomaki. Prov. Suruga: Mt. Fuji. Prov. Kii: Seto-Kanayama. Prov. Ise: Akogigaura. Prov. Inaba: Suetsune-mura; Hamasaka near Tottori. Prov. Shinano: Mt. Asama. *Kiushû*:- Prov. Higo: Ariake-mura. Prov. Satsuma: Kagoshima. *Korea*:- Prov. Kannan: Genzan. Prov. Kôgen: Onseiri. Prov. Keiki: Seiryôri.

On *Potentilla chinensis* Ser. var. *littoralis* Nakai (*Hama-saiko*). *Korea*:- Prov. Kannan: Genzan.

On *Potentilla Matsumurae* Wolf. (*Miyama-kimbai*). *Honshû*:- Prov. Mutsu: Mt. Iwaki. Prov. Rikuchû: Mt. Hayachine.

On *Potentilla nipponica* Wolf. (*Hiroha-no-kawarasaiiko*). *Honshû*:- Prov. Rikuchû: Mt. Himekami; Mt. Iwate.

58. ***Gymnosporangium nipponicum*** Yamada, l. c. p. 143.

On *Juniperus chinensis* L. var. *Sargentii* Henry (*Miyama-byakushin*). *Honshû*:- Prov. Rikuchû: Mt. Hayachine (*type!*); Mt. Iwate; Morioka.

59. ***Xenodochus carbonarius*** Schlechtendal (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (8), 1929; Mem. Tottori Agric. Coll. I, p. 77, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 38, 1932; Jour. Jap. Bot. X, p. 220, 1934; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (78), 1928; Hori in Bot. Mag. Tokyo, VI, p. 106, 1892; Kawai & Otani in Transact.

Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Togashi in Jap. Jour. Bot. II, p. 92, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 31, 1934). Syn. *Phragmidium carbonarium* (Schlecht.) Wint. (Dietel in Engl. Bot. Jahrb. XXVII, p. 567, 1899; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 42, 1910).

On *Sanguisorba albiflora* Mak. (*Shirobana-tôchisô*). Honshû:- Prov. Rikuchû: Mt. Hayachine; Mt. Iwate; Mt. Yakeishi-dake; Mt. Suka-wa-dake. Prov. Ugo: Mt. Komagatake; Mt. Chôkai.

On *Sanguisorba grandiflora* Mak. (*Sanguisorba tenuifolia* Fisch. var. *grandiflora* Maxim.) (*Chishima-waremokô*). Kuriles:- Shimushir: Mt. Kamui.

On *Sanguisorba hakusanensis* Mak. (*Karaitosô*). Honshû:- Prov. Shinano: Mt. Shirouma-dake.

On *Sanguisorba officinalis* L. (*Waremokô*). Honshû:- Prov. Shimotsuke: Senjôgahara (Nikkô); Nikkô. Prov. Rikuchû: Koiwai near Morioka. Prov. Musashi: Tokyo. Prov. Shinano: Mt. Yatsugatake. Prov. Hôki: Mt. Daisen. Prov. Idzumo: Kijima-mura.

On *Sanguisorba tenuifolia* Fisch. var. *alba* Trautv. et. Mey. (*Shirobana-no-waremokô*). *S. Saghalien*:- Shisuka; Kurokawa; Kita-Nayoshi; Ochiai; Naibuchi; Esutoru. *Hokkaidô*:- Prov. Ishikari: Garugawa; Horomui; Mt. Yûbari-dake. Prov. Ihuri: Numanohata. Prov. Kitami: Kabuka (Rebun); Rishiri Isl. Prov. Tokachi: Shintoku. Prov. Kushiro: Nanamagari (Akan). Prov. Nemuro: Nemuro. Prov. Teshio: Kenbuchi. *Kuriles*:- Etorofu: Shana. Kunashiri: Furukamappu; Nikishiro; Cape Atoiya. Shikotan: Shakotan.

60. **Xenodochnus minor** Arthur (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 243, 1931; IV, p. 38, 1932; Jour. Jap. Bot. X, p. 130, 1934; Bot. & Zool. II, p. 546, 1934).

On *Sanguisorba sitchensis* Trautv. et Mey. (*Takane-tôchisô*). *S. Saghalien*:- Mt. Tosso. *Hokkaidô*:- Prov. Ishikari: Hakuun-sawa (Daisetsuzan).

61. **Gymnoconia Peckiana** (Howe) Trotter (Hiratsuka, f. in Jour. Jap. Bot. X, p. 3, 1934). Syn. *Gymnoconia interstitialis* Lagerh. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 243, 1931).

On *Rubus arcticus* L. (*Chishima-ichigo*). *S. Saghalien*:- Shisuka.

On *Rubus pseudo-japonicus* Koidz. (*Hime-goyô-ichigo*). *Hokkaidô*:- Prov. Tokachi: Mt. Tsurugi.

62. **Melampsora Kusanoi** Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 291, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 234, 1927; Bot. Mag. Tokyo, XLII, p. 27, 1928; XLIX, p. 150, 1935; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (9), 1929; Mem. Tottori Agric. Coll. I, p. 78, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 144, 1933; Jour. Jap. Bot. X, p. 617, 1934; Bot. & Zool. II, p. 546, 1934; Hiratsuka, f. & Hashioka in Transact. Tottori Soc. Agric. Sci. IV, p. 162, 1933; Bot. Mag. Tokyo, XLIX, p. 26, 1935; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (78), 1928; Sydow in Ann. Myc. XI, p. 109, 1913; Togashi in Jap. Jour. Bot. II, p. 82, 1924). Syn. *Melampsora Hypericorum* (not Schrôt.) (Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 84, 1933; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 15, 1934, sub *Melampsora Hypericum*).

On *Elodes japonica* Bl. (*Hypericum crassifolium* Nakai, *H. virginicum* L. var. *japonicum* Matsum.) (*Midzu-otogiri*). *Hokkaidô*:- Prov. Shiribeshi: Zenibako. Prov. Ihuri: Chitose. Prov. Ishikari: Garugawa; Horomui. Prov. Kitami: Otatomari (Rishiri); Oniwaki~Sempôji (Rishiri). Prov. Kushiro: Shitakara.

On *Hypericum Ascyron* L. (*Tomoosô*). *Hokkaidô*:- Prov. Hidaka: Hiratori. Prov. Shiribeshi: Zenibako. Prov. Ihuri: Chitose. Prov. Ishikari: Noppo; Sapporo; Mt. Moiwa; Maruyama; Garugawa; Makomana; Jôzankei; Horomui. Prov. Kitami: Abashiri. Prov. Kushiro: Nanamagari (Akan); Onne-moshiri (Akan); Shitakara. Honshû:- Prov. Shimotsuke: Yumoto (Nikkô) (*type!*). Prov. Rikuchû: Yanagawa. *Korea*:- Prov. Kôgen: Kongômon (Soto-Kongô).

On *Hypericum Gebleri* C. A. Mey. (*Suzuya-tomoe*). *S. Saghalien*:- Ôdomari.

On *Hypericum hakonense* Franch. et Sav. (*Ko-otogiri*). Honshû:- Prov. Rikuchû: Mt. Hayachine.

On *Hypericum kamtschaticum* Ledeb. (*Iwa-otogiri*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Goshiki-taira (Daisetsuzan). Honshû:- Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Komagatake (Kiso); Mt. Tsubakuro-dake.

On *Hypericum Nagasawai* Hayata (*Niitaka-otogiri*). *Formosa*:- Prov. Tainan: Mt. Niitaka.

On *Hypericum paramushirensis* Kudo (*Ruesan-otogiri*). *Kuriles*:- Shimushir: Broughton-wan. This host plant was erroneously recorded

by the writer (26) in 1929 as *Hypericum kamschaticum* Ledeb.

On *Hypericum senanense* Maxim. (*Miyama-otogiri*). *Honshû*:- Prov. Shinano: Mt. Tsubakuro-dake.

On *Hypericum taihezanense* Suzuki (*Taihei-otogiri*). *Formosa*:- Prov. Tainan: Mt. Arisan.

63. **Chnoopsora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 297, 1927. (Hiratsuka, f. in Bot. Mag. Tokyo, XLII, p. 28, 1928; XLVIII, p. 236, 1934; Jour. Soc. Agric. & Forestr. Sapporo, XXI, p. 327, 1930; Mem. Tottori Agric. Coll. I, p. 79, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 39, 1932; Jour. Jap. Bot. X, p. 131, 1934; Hiratsuka, f. & Hashioka in Bot. Mag. Tokyo, XLVIII, p. 236, 1934; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 84, 1933; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 14, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). *S. Saghalien*:- Mt. Tosso. *Hokkaidô*:- Prov. Ishikari: Mt. Teine; Jôzankei; Mt. Kuro-dake; Sôunkei; Kushinai. Prov. Iburi: Chitose. Prov. Tokachi: Pankenikoro (Kuttari). Prov. Kushiro: Mt. Meakan-dake. Prov. Nemuro: Ochiai. *Kuriles*:- Kunashiri: Mt. Chacha-nupuri. *Honshû*:- Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake; Mt. Hayachine. Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake. *Shikoku*:- Prov. Tosa: Mt. Shiraga.

On *Oxalis Acetosella* L. var. *japonica* Mak. (*Miyama-katabami*). *Honshû*:- Prov. Rikuchû: Mt. Yakeishi-dake; Sengan-tôge; Kunimi-tôge; Hashiba. Prov. Uzen: Mt. Hagurosan. Prov. Inaba: Mt. Hyô-nosen. Prov. Hôki: Mt. Daisen. Prov. Idzumo: Wanibuchi-mura. *Shikoku*:- Prov. Tosa: Mt. Yokogura.

On *Oxalis Griffithi* Edgew. et Hook. f. (*Arisan-katabami*). *Formosa*:- Prov. Tainan: Mt. Kodama (Niitaka Mts.). Prov. Shinchiku: Mt. Iza-wa (Taiha Mts.). Prov. Taihoku: Mt. Nanko.

On *Oxalis obtriangulata* Maxim. (*Ô-yama-katabami*). *Honshû*:- Prov. Inaba: Manisan near Tottori; Ôkaya-mura; Shiomi-mura; Mt. Nagi-san. Prov. Hôki: Mt. Daisen. Prov. Idzumo: Kijima-mura.

64. **Melampsorella Caryophyllacearum** Schröter (Hiratsuka, f. in Jap. Jour. Bot. III, p. 299, 1927; Bot. Mag. Tokyo, XLII, p. 28 & 504, 1928; Transact. Tottori Soc. Agric. Sci. IV, p. 40, 1932; p. 146, 1933; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 84, 1933; Naito & Yagi in Transact. Nat. Hist.

Soc. Kagoshima Imp. Coll. Agric. & Forestr. no. 11, p. 15, 1933; Sydow in Ann. Myc. XI, p. 110, 1913; Togashi in Jap. Jour. Bot. II, p. 82, 1924; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (32), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930). Syn. *Melampsorella elatina* Arth. (Hiratsuka, f. in Agric. & Hort. V, p. 153~164, 1930; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (9), 1929; p. 328, 1930). *Melampsorella Cerastii* Wint. (Hiratsuka, f. in Mem. Tottori Agric. Coll. I, p. 80, 1930; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 239, 1931).

On *Abies firma* Sieb. et Zucc. (*Momi*). *Honshû*:- Prov. Musashi: Tokyo. Prov. Suruga: Miyanosita (Hakone). Prov. Shinano: Karui-sawa, Prov. Inaba: Tottori. Prov. Hôki: Daisenji. *Shikoku*:- Prov. Tosa: Asakura-mura. *Kiushû*:- Prov. Ôsumi: Mt. Kirishima.

On *Abies homolepis* Sieb. et Zucc. (*A. brachyphylla* Maxim.) (*Urajiro-momi*). *Honshû*:- Prov. Shimotsuke: Nikkô.

On *Abies Mariesii* Mast. (*Aomori-todomatsu*). *Honshû*:- Prov. Iwa-shiro: Oze-numa. Prov. Shinano: Mt. Komagatake (Kiso).

On *Abies Mayriana* Miyabe et Kudo (*Ao-todomatsu*). *Hokkaidô*:- Prov. Ishikari: Sapporo; Nopporo. Prov. Iburi: Lake-side of Shiko-tsu-ko. Prov. Shiribeshi: Zenibako.

On *Abies sachalinensis* Fr. Schm. (*Aka-todomatsu*). *S. Saghalien*:- No-boripo. *Hokkaidô*:- Prov. Hidaka: Fuyushima. Prov. Kushiro: Lake-side of Mashû-ko. *Kuriles*:- Etorofu: Naibo.

On *Abies Veitchii* Lindl. (*Shirabiso*). *Honshû*:- Prov. Shinano: Mt. Yatsugatake; Mt. Komagatake (Kiso).

On *Cerastium alpinum* L. var. *beeringianum* Rgl. (*Takane-miminagusa*). *Honshû*:- Prov. Shinano: Mt. Yatsugatake.

On *Cerastium schizopetalum* Maxim. (*Miyama-miminagusa*). *Honshû*:- Prov. Shinano: Mt. Komagatake (Kiso).

On *Cerastium vulgatum* L. var. *glandulosum* Rgl. (*Miminagusa*). *S. Saghalien*:- Ôdomari; Takinosawa; Kaizuka. *Hokkaidô*:- Prov. Oshima: Mt. Komagatake. Prov. Ishikari: Sapporo; Mt. Kuro-dake. Prov. Iburi: Chitose. Prov. Shiribeshi: Zenibako. Prov. Kitami: Sempôji (Rishiri). Prov. Tokachi: Lake-side of Shikaribetsu-numa. *Kuriles*:- Kunashiri: Nikishiro. *Honshû*:- Prov. Musashi: Tokyo. Prov. Inaba: Tottori. Prov. Hôki: Mt. Daisen. *Korea*:- Prov. Kôgen: Onseiri (So-to-Kongô).

On *Stellaria florida* Fisch. var. *angustifolia* Maxim. (*Iwa-tsumekusa*). *Honshû*:- Prov. Shinano: Mt. Komagatake (Kiso).

On *Stellaria longifolia* Mühlb. (*Nagaba-tsumekusa*). *S. Saghalien*:- Higashi-Taraika; Kitz-Nayoshi; Akashiki.

On *Stellaria media* Cyr. (*Hakobe*). *Hokkaidô*:- Prov. Oshima: Mt. Komagatake. Prov. Ishikari: Sapporo. Prov. Shiribeshi: Zenibako.

On *Stellaria radians* L. (*Yezo-yamahakobe*). *S. Saghalien*:- Aihama; Ambetsu: Higashi-Taraika. *Hokkaidô*:- Prov. Kushiro: Pontô (Lake-side of Kutcharo-ko).

On *Stellaria yezoensis* Maxim. (*Yezo-fusuma*). *Hokkaidô*:- Prov. Ishikari: Sôunkei. Prov. Kitami: Mt. Rishiri; Uennai (Rebun). Prov. Nemuro: Ochiishi-saki. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

65. **Melampsorium Alni** (Thüm.) Dietel (Dietel in Engl. Bot. Jahrb. XXXII, p. 627, 1903; Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 7, 1927; Jap. Jour. Bot. III, p. 299, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 234, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, p. 61, 1929; p. 327, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 39 & 147, 1932; Bot. Mag. Tokyo, XLII, p. 28, 1928; Mem. Tottori Agric. Coll. I, p. 79, 1930; Jour. Jap. Bot. XI, p. 281, 1935; Nambu in Bot. Mag. Tokyo, XVIII, p. (2), 1904; Togashi in Jap. Jour. Bot. II, p. 82, 1924). Syn. *Melampsora Alni* Thüm.? (Kusano in Bot. Mag. Tokyo, XVI, p. (200), 1902). *Melampsorium Alni-pendulae* Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 8, 1927. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 300, 1927; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 268, 1927). *Melampsorium Alni-firmae* Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 9, 1927. (Naito & Yagi in Transact. Nat. Hist. Soc. Kagoshima Imp. Coll. Agric. & Forestr., no. 11, p. 17, 1933).

On *Alnus alnobetula* Hartig var. *fruticosa* Winkl. (*Miyama-hannoki*). *S. Saghalien*:- Nayoro; Mt. Ushoro; Hamdasa. *Hokkaidô*:- Prov. Oshima: Ônuma; Mt. Komagatake. Prov. Shiribeshi: Raiden-tôge; Zenibako. Prov. Ibur.: Shikotsu-ko. Prov. Ishikari: Sapporo; Yamahana near Sapporo; Mt. Moiwa; Makomanai; Hirakishi-mura; Misumai; Mt. Teine; Mt. Sapporo-dake; Sôunkei; Jôzankei. Prov. Kitami: Kabuka (Rebun), Oshidomari (Rishiri). Prov. Kushiro: Mt. Oakan-dake. *Honshû*:- Prov. Mutsu: Mt. Iwaki. Prov. Rikuchû: Mt. Iwate. Prov. Shimotsuke:-Mt. Shirane (Nikkô). Prov. Shinano: Mt. Yatsugatake; Mt. Tsubakuro-dake; Mt. Komagatake (Kiso). Prov. Suruga: Mt. Fuji.

On *Alnus alnobetula* Hartig var. *sachalinensis* Koidz. (*Karafuto-mi-*

yama-hannoki). *S. Saghalien*:- Shisuka.

On *Alnus firma* Sieb. et Zucc. var. *hirtella* Franch. et Sav. (*Ôminebari*). *Honshû*:- Prov. Mutsu: Sukayu in Mt. Hakkôda. Prov. Shinano: Mt. Tsubakuro-dake. *Shikoku*:- Prov. Iyo: Higashi-Sambô-gamori.

On *Alnus firma* Sieb. et Zucc. var. *Sieboldiana* Winkl. (*Yashabushi*). *Honshû*:- Prov. Idzu: Mt. Amagi; Itô; Atami. Prov. Shinano: Mt. Tsubakuro-dake. Prov. Inaba: Tottori. *Shikoku*:- Prov. Awa: Mt. Tsurugi. *Kiushû*:- Prov. Hiuga: Mt. Kirishima. Prov. Ôsumi: Mt. Takakuma.

On *Alnus pendula* Matsum. (*Alnus firma* Sieb. et Zucc. var. *multinervis* Rgl.) (*Hime-yashabushi*). *Hokkaidô*:- Prov. Shiribeshi: Zenibako. *Honshû*:- Prov. Mutsu: Sukayu in Mt. Hakkôda. Prov. Rikuchû: Mt. Iwate; Nanshōzan. Prov. Noto: Tadzuruhama-mura. Prov. Kaga: Yamanaka-machi. Prov. Echizen: Awano-mura. Prov. Yamashiro: Kyoto. Prov. Inaba: Tottori; Ôkaya-mura; Inabayama near Tottori; Mt. Hyōnoson. Prov. Hōki: Mt. Daisen; Daisenji.

66. **Pucciniastrum Pyrolae** (Karst.) Schröter (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 28, 68 & pl. I, fig. 9, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 235, 1927; Jap. Jour. Bot. III, p. 302, 1927; Bot. Mag. Tokyo, XLII, p. 29 & 504, 1928; XLIV, p. 265, 1929; Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 88), p. (120), 1928; XXI, (no. 95), p. (9), 1929; Mem. Tottori Agric. Coll. I, p. 81, 1930; Jour. Jap. Bot. XI, p. 332, 1935; Hiratsuka, f. & Hashioka in Bot. Mag. Tokyo, XLIX, p. 523, 1935).

On *Chimaphila taiwaniana* Masamune (*Taiwan-umegasasô*). *Formosa*:- Prov. Taihoku: Mt. Nanko.

On *Chimaphila umbellata* Nutt. (*Ô-umegasasô*). *Hokkaidô*:- Prov. Oshima: Mt. Komagatake. Prov. Ibur.: Numanohata.

On *Pirola media* Sw. (*Maruba-no-ichiyakusô*). *Kuriles*:- Etorofu: Shana. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Pirola minor* L. (*Yezo-ichiyakusô*). *S. Saghalien*:- Ambetsu; Sa-kaehama. *Hokkaidô*:- Prov. Kitami: Mt. Rishiri. *Kuriles*:- Paramushir.

On *Pirola renifolia* Maxim. (*Jinyô-ichiyakusô*). *Hokkaidô*:- Prov. Oshima: Ônuma. Prov. Shiribeshi: Okushiri. Prov. Ibur.: Tomakomai. Prov. Ishikari: Jôzankei; Mt. Sapporo-dake. Prov. Hidaka: Mt. Apoi. Prov. Kushiro: Mt. Meakan-dake.

On *Pirola rotundifolia* L. var. *incarnata* DC. (*Benibana-ichiyakusô*).

Hokkaidô:- Prov. Oshima; Mt. Komagatake. Prov. Ishikari: Maruyama. Prov. Iwate: Numanohata. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Pirola secunda* L. var. *vulgaris* Herd. (*Yama-ichiyakusô*). *S. Saghalien*:- Ôdomari; Ushoro; Toyohara; Noboripo. *Hokkaidô*:- Prov. Ishikari: Mt. Soranuma-dake; Nopporo; Mt. Teine; Jôzankei. Prov. Shiribeshi: Zenibako-tôge. Prov. Iwate: Chitose. Prov. Tokachi: Mt. Memoro-dake. Prov. Kushiro: Mt. Meakan-dake.

67. **Thekopsora Myrtilina** Karsten (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 19, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 236, 1927; Jap. Jour. Bot. III, p. 309, 1927; Bot. Mag. Tokyo, XLII, p. 30, 1928; XLIII, p. 16, 1929; Jour. Soc. Agric. & Forestr. Sapporo, XIX, p. 566, 1928; XXI, (no. 95), p. (10); p. 62, 1929; p. 331, 1930; Mem. Tottori Agric. Coll. I, p. 84, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 151, 1933; Bot. & Zool. II, p. 544 & 546, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 270, 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 240, 1931; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930). Syn. *Thekopsora Vacciniorum* (not Karst.) (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (34), 1905).

On *Vaccinium axillare* Nakai (*Kuro-usugo*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake. *Honshû*:- Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Iwate. Prov. Suruga: Mt. Akaishi. Prov. Shinano: Mt. Komagatake (Kiso); Mt. Yatsugatake.

On *Vaccinium Chamissonis* Bong. (*Yezo-kurousugo*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake.

On *Vaccinium hirtum* Thunb. (*Kakumino-sunoki*). *Shikoku*:- Prov. Tosa: Mt. Eboshi-washio; Asakura-mura; Kamoda-mura.

On *Vaccinium Smallii* A. Gray (*Oba-sunoki*). *S. Saghalien*:- Ambe-tsu. *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Vaccinium uliginosum* L. (*Kuromame-no-ki*). *S. Saghalien*:- Shisuka; Mt. Tosso; Kushunnai. *Hokkaidô*:- Prov. Ishikari: Kumonotaira (Daisetsuzan); Daifunkwakô (Daisetsuzan); Mt. Kuro-dake; Mt. Hokkai-dake; Mt. Nisekaushipe. *Kuriles*:- Shikotan: Shakotan. Urup: Tokotan. Shimushir: Yamagoshi-saki. *Honshû*:- Prov. Shimotsuke: Mt. Shirane (Nikkô). Prov. Shinano: Mt. Komagatake (Kiso).

On *Vaccinium Usunoki* Nakai (*Usunoki*). *Honshû*:- Prov. Mutsu: Mt. Hakkôda.

On *Xolisma elliptica* Nakai (*Kashioshimi*). *Honshû*:- Prov. Kaga: Yamanaka-machi. Prov. Wakasa: Obama. Prov. Tango: Yoshidzu-mura. Prov. Inaba: Enoki-tôge.

68. **Thekopsora sparsa** (Wint.) Magnus (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 24, 1927; Jap. Jour. Bot. III, p. 308, 1927; Bot. Mag. Tokyo, XLII, p. 30, 1928; XLIII, p. 19, 1929; Jour. Soc. Agric. & Forestr. Sapporo, XIX, p. 566, 1928; XXI, (no. 95), p. (10), 1929; Mem. Tottori Agric. Coll. I, p. 84, 1930; Transact. Tottori Soc. Agric. Sci. II, p. 62, 1930; Bot. & Zool. II, p. 546, 1934; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 17, 1934).

On *Arctous japonicus* Nakai (*Kuma-kokemomo*). *S. Saghalien*:- Mt. Ushoro; Mt. Tosso; Mt. Nupuripo. *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake. *Kuriles*:- Urup: Tokotan. Matsuwa: Miharashi-dai. *Honshû*:- Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Komagatake (Kiso).

69. **Thekopsora Tripetaleiae** Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 23, 1927. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 308, 1927; Bot. Mag. Tokyo, XLIII, p. 18, 1929; Jour. Soc. Agric. & Forestr. Sapporo, XXI, p. 331, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 41, 1932; p. 151, 1933; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 269, 1927; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 18, 1934). Syn. *Uredo Tripetaleiae* Diet. in Ann. Myc. XII, p. 85, 1914.

On *Tripetaleia bracteata* Maxim. (*Miyama-hotsutsuji*). *Hokkaidô*:- Prov. Oshima: Ônuma. Prov. Ishikari: Mt. Kuro-dake. *Honshû*:- Prov. Mutsu: Mt. Hakkôda; Mt. Iwaki. Prov. Rikuchû: Mt. Yakeishi-dake; Mt. Hayachine; Mt. Iwate; Mt. Sukawa-dake. Prov. Ugo: Mt. Komagatake. Prov. Shimotsuke: Mt. Shirane (Nikkô). Prov. Suruga: Mt. Fuji. Prov. Shinano: Mt. Komagatake (Kisô).

On *Tripetaleia paniculata* Sieb. et Zucc. (*Hotsutsuji*). *Hokkaidô*:- Prov. Hidaka: Samani. *Honshû*:- Prov. Rikuchû: Mt. Iwate; Mt. Yakeishi-dake; Mt. Hayachine; Nanshōzan. Prov. Kaga: Yamanaka-machi. Prov. Tango: Yoshidzu-mura. Prov. Inaba: Mt. Hyōnosen. Prov. Hōki: Mt. Daisen.

70. **Thekopsora Vacciniorum** Karsten (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidō Imp. Univ. XXI, p. 20, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 236, 1927; Jap. Jour. Bot. III, p. 309, 1927; Bot. Mag. Tokyo, XLII, p. 30, 1928; XLIII, p. 15, 1929; Mem. Tottori Agric. Coll. I, p. 84, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 151, 1933; Jour. Soc. Agric. & Forestr. Sapporo, XIX, p. 566, 1928; XXI, (no. 95), p. (10), 1929; Bot. & Zool. II, p. 544, 545 & 546, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 270, 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 240, 1931; Togashi in Jap. Jour. Bot. II, p. 83, 1924).

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). *S. Saghalien*:- Mt. Tosso; Sakaehama; Ahihama; Horo; Ōdomari. *Hokkaidō*:- Prov. Ihuri: Noboribetsu. Prov. Ishikari: Mt. Sapporo-dake; Mt. Soranuma-dake; Kumonotaira (*Daisetsuzan*); Mt. Hakuun-dake; Mt. Ushiro-Asahidake. Prov. Kitami: Mt. Rishiri; Momoiwa (*Rebun*). Prov. Tokachi: Mt. Saoro-dake. Prov. Kushiro: Mt. Oakan-dake; Mt. Meakan-dake. *Kuriles*:- Urup: Kobuneminato. *Honshū*:- Prov. Mutsu: Mt. Iwaki; Mt. Hakkōda. Prov. Rikuchū: Mt. Iwate; Mt. Yakeishi-dake. Prov. Shimotsuke: Mt. Shirane (*Nikkō*). Prov. Suruga: Mt. Fuji. Prov. Shinano: Mt. Komagatake (*Kiso*); Mt. Tsubakuro-dake; Mt. Yatsugatake. Prov. Echigo: Mt. Myōkō.

71. **Hyalopsora Polypodii** (Diet.) Magnus (Hiratsuka, f. in Bot. Mag. Tokyo, XLII, p. 31, 1928; XLIX, p. 26, 1935; Jap. Jour. Bot. III, p. 311, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XIX, p. 120, 1928; XXI, (no. 95), p. (10), 1929; Mem. Tottori Agric. Coll. I, p. 86, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 41 & 71, 1932; Jour. Jap. Bot. XI, p. 41 & 282, 1935; Hiratsuka, f. & Hashioka in Transact. Tottori Soc. Agric. Sci. IV, p. 163, 1933; Bot. Mag. Tokyo, XLIX, p. 26, 1935; Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 15 & 72, 1932; Naito & Yagi in Transact. Nat. Hist. Soc. Kagoshima Imp. Coll. Agric. & Forestr. no. 11, p. 15, 1933; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 15, 1934). Syn. *Pucciniastrum* (*Thekopsora*) *Filicum* Diet. in Engl. Bot. Jahrb. XXVII, p. 567, 1899. (Dietel in Engl. Bot. Jahrb. XXVIII, p. 286, 1900; XXXIV, p. 588, 1905; Hennings in Engl. Bot. Jahrb. XXIX, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904). *Hyalopsora filicum* Diet. in Engl. Bot.

Jahrb. XXXVII, p. 105, 1905; Ann. Myc. V, p. 76, 1907. (Dietel in Ann. Myc. VIII, p. 313, 1910; Hiratsuka, f. in Jap. Jour. Bot. III, p. 310, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, p. 331, 1930; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930). *Hyalopsora Asplenii-Wichuriae* Diet. in Ann. Myc. VI, p. 228, 1908. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

This species is widely distributed throughout our country, on the following ferns; *Athyrium nipponicum* Hance. (*Inu-warabi*) (*Hokkaidō*, *Honshū* and *Kiushū*), *A. Filix-foemina* Roth. var. *nigropaleaceum* Mak. (*Miyama-meshida*) (*Honshū*), *A. iseanum* Rosenstock (*Hosoba-inuwarabi*) (*Honshū*), *A. pterorachis* Christ (*Ō-meshida*) (*Hokkaidō*), *Blechnum orientale* L. (*Hiryū-shida*) (*Formosa*), *Cystopteris fragilis* Bernh. (*Nayo-shida*) (*S. Saghalien*, *Hokkaidō* and *Kuriles*), *Diplazium japonicum* Bedd. (*Shike-shida*) (*Honshū* and *Kiushū*), *D. squamigerum* Christ (*Kiyotaki-shida*) (*Honshū*), *D. Taequetii* C. Chr. (*Shiroyama-shida*) (*Shikoku* and *Kiushū*), *D. Wichuriae* Diels. (*Nokogiri-shida*) (*Honshū* and *Shikoku*), *Dryopteris africana* C. Chr. (*Mizo-shida*) (*Hokkaidō*, *Honshū* and *Kiushū*), *D. decursivo-pinnata* Kuntze (*Gejigeji-shida*) (*Honshū*, *Shikoku*, *Kiushū* and *Formosa*), *D. gracilescens* Kuntze var. *glanduligerum* Mak. (*Hashigo-shida*) (*Honshū*), *D. laxa* C. Chr. (*Yawara-shida*) (*Honshū*) and *Matteuccia orientalis* Trev. (*Inugansoku*) (*Hokkaidō* and *Honshū*).

72. **Uredinopsis filicina** (Niessl) Magnus (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 236, 1927; X, p. 120, 1929; Jap. Jour. Bot. III, p. 312, 1927; Mem. Tottori Agric. Coll. I, p. 86, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 152, 1933; Jour. Jap. Bot. X, p. 473 & fig. 12, 1934; Bot. Mag. Tokyo, XLIX, p. 151, 1935; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 84, 1933; Togashi in Jap. Jour. Bot. II, p. 83, 1924).

On *Dryopteris Phegopteris* C. Chr. (*Miyama-warabi*). *S. Saghalien*:- Mt. Shiritori; Mt. Kashipo. *Hokkaidō*:- Prov. Ihuri: Mt. Makkari-nupuri. Prov. Ishikari: Sapporo; Jōzankei; Mt. Sapporo-dake; Mt. Soranuma-dake. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake. *Kuriles*:- Kunashiri: Uennai. *Honshū*:- Prov. Mutsu: Mt. Hakkōda. Prov. Rikuchū: Mt. Iwate. Prov. Shimotsuke: Mt. Shirane (*Nikkō*). Prov. Shinano: Mt. Komagatake (*Kiso*); Mt. Yatsugatake; Mt. Tsubakuro-dake. *Shikoku*:- Prov. Iyo: Omogōsan. *Korea*:- Prov. Kōgen: Bishamon (*Soto-Kongō*).

73. *Calyptospora Goeppertiana* Kühn (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 233, 1927; X, p. 120, 1929; Jap. Jour. Bot. III, p. 310, 1927; Bot. Mag. Tokyo, XLII, p. 31, 1928; Mem. Tottori Agric. Coll. I, p. 85, 1930; Jour. Jap. Bot. IX, p. 277 & figs. 2~4, 1933; Transact. Tottori Soc. Agric. Sci. IV, p. 151, 1933; Bot. & Zool. II, p. 544, 545 & 546, 1934; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 84, 1933). Syn. *Calyptospora columnare* Kühn (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, p. 62, 1929).

On *Abies sachalinensis* Fr. Schm. (*Aka-todomatsu*). *S. Saghalien*:- Ōdomari; Konuma; Shisuka.

On *Vaccinium Vitis-Idaea* L. (*Kokemomo*). *S. Saghalien*:- Ōdomari; Sakaehama; Aihama; Manui; Mt. Tosso; Mt. Nupuripo; Mt. Ushoro; Mt. Shiraraka; Shisuka; Ambetsu; Horo; Mt. Shiritori; Mt. Kashipo. *Kuriles*:- Kunashiri; Mt. Chacha-nupuri. *Hokkaidō*:- Prov. Kushiro: Mt. Oakan-dake; Akan~Kutcharo-sandō. Prov. Tokachi: Mt. Tsurugi. Prov. Ishikari: Mt. Hakuun-dake. *Honshū*:- Prov. Suruga: Mt. Fuji. Prov. Shimotsuke: Mt. Shirane (Nikkō). Prov. Shinano: Mt. Tsubakuro-dake; Mt. Komagatake (Kiso); Mt. Yatsugatake.

74. *Chrysomyxa alpina* Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 471, 1929. (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (11), 1929; Mem. Tottori Agric. Coll. I, p. 87, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 14, 1932; Bot. & Zool. II, p. 544 & 546, 1934; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 238, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 85, 1933). Syn. *Chrysomyxa expansa* (not Diet.) (Hiratsuka, f. in Bot. Mag. Tokyo, XLII, p. 31, 1928; Togashi in Jap. Jour. Bot. II, p. 81, 1924).

On *Rhododendron chrysanthum* Pall. (*Kibana-shakunage*). *S. Saghalien*:- Mt. Tosso; Mt. Kashipo. *Hokkaidō*:- Prov. Shiribeshi: Mt. Makari-nupuri. Prov. Ishikari: Mt. Sapporo-dake; Mt. Kuro-dake; Mt. Eboshi-dake (Daisetsuzan); Kumonotaira (Daisetsuzan); Mt. Hakuun-dake. Prov. Kitami: Mt. Rishiri. *Kuriles*:- Shikotan: Shakotan. Kunashiri: Mt. Chacha-nupuri. *Honshū*:- Prov. Shinano: Mt. Yatsugatake.

75. *Chrysomyxa Empetri* Schröter (Hiratsuka, f. in Jour. Facul.

Agric. Hokkaidō Imp. Univ. XXI, p. 33, 1927; Jap. Jour. Bot. III, p. 316, 1927; Transact. Sapporo Nat. Hist. Soc. IX, p. 234, 1927; Bot. Mag. Tokyo, XLII, p. 32, 1928; XLIII, p. 475, 1929; Mem. Tottori Agric. Coll. I, p. 88, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 153, 1933; Bot. & Zool. II, p. 544 & 546, 1934; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 15, 1934).

On *Empetrum nigrum* L. (*Gankōran*). *S. Saghalien*:- Mt. Tosso. *Hokkaidō*:- Prov. Ishikari: Mt. Kuro-dake. Prov. Tokachi: Lake-side of Shikaribetsu-numa. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake. Prov. Nemuro: Nemuro. *Honshū*:- Prov. Rikuchū: Mt. Haya-chine. Prov. Shinano: Mt. Yatsugatake; Mt. Komagatake (Kiso); Mt. Tsubakuro-dake. Prov. Shimotsuke: Mt. Shirane (Nikkō).

76. *Chrysomyxa expansa* Dietel in Engl. Bot. Jahrb. XXVIII, p. 287, 1900. (Hiratsuka, f. in Jap. Jour. Bot. III, p. 314, 1929, p. p.; Transact. Sapporo Nat. Hist. Soc. IX, p. 234, 1927; Bot. Mag. Tokyo, XLIII, p. 472, 1929; XLVIII, p. 238, 1934; Transact. Tottori Soc. Agric. Sci. IV, p. 153, 1933; Jour. Jap. Bot. X, p. 132 & fig. 4, 1934; Bot. & Zool. II, p. 544, 1934; Hiratsuka, f. & Hashioka in Bot. Mag. Tokyo, XLVIII, p. 238, 1934; Miyabe in Bot. Mag. Tokyo, XXIX, p. 258, 1915, p. p.).

On *Picea jezoensis* Carr. (*Yezo-matsu*). *Hokkaidō*:- Prov. Ishikari: Ochiai.

On *Rhododendron Degronianum* Carr. (*Shakunage*). *Honshū*:- Prov. Shimotsuke: Nikkō (*type!*).

On *Rhododendron Fauriae* Franch. (*Usuki-shakunage*). *Honshū*:- Prov. Shinano: Mt. Yatsugatake.

On *Rhododendron Fauriae* Franch. var. *roseum* Nakai (*Yezo-shakunage*). *Hokkaidō*:- Prov. Ishikari: Kanayama; Ochiai; Kushinai; Mt. Kuro-dake. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake. Prov. Tokachi: Lake-side of Shikaribetsu-numa.

On *Rhododendron Morii* Hayata (*Mori-shakunage*). *Formosa*:- Prov. Tainan: Mt. Niitaka (Sekizan).

On *Rhododendron nankotaisanense* Hayata (*Nanko-shakunage*). *Formosa*:- Prov. Taihoku: Mt. Nanko (Kiretto).

On *Rhododendron pseudo-chrysanthum* Hayata (*Niitaka-shakunage*). *Formosa*:- Prov. Tainan: Mt. Niitaka (Sekizan).

77. *Chrysomyxa Ledi* De Bary (Hiratsuka, f. in Jour. Facul.

Agric. Hokkaidô Imp. Univ. XXI, p. 34, 1927; Jap. Jour. Bot. III, p. 315, 1927; Bot. Mag. Tokyo, XLII, p. 32, 1928; XLIII, p. 468, 1929; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (11) & 62, 1929; Transact. Sapporo Nat. Hist. Soc. X, p. 121, 1929; Mem. Tottori Agric. Coll. I, p. 87, 1930; Bot. & Zool. II, p. 546, 1934; Hiratsuka, f. & Homma in Jour. Soc. Agric. & Forestr. Sapporo, XIX, (no. 85), p. (78), 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 239, 1931; Terui in Transact. Sapporo Nat. Hist. Soc. XI, p. 159, 1930).

On *Picea jezoensis* Carr. (*Yezo-matsu*). *S. Saghalien*:- Manui.

On *Ledum palustre* L. var. *angustum* Bursch (*Hosoba-isotsutsuji*). *S. Saghalien*:- Mt. Tosso; Shisuka.

On *Ledum palustre* L. var. *dilatatum* Wahl. (*Karafuto-isotsutsuji*). *S. Saghalien*:- Kurokawa; Shisuka; Aihama; Manui; Mt. Kashipo. *Hokkaidô*:- Prov. Tokachi: Mt. Nupukaushi. Prov. Kushiro: Mt. Meakan-dake; Mt. Oakan-dake; Kawayu; Mt. Atosa-nupuri. Prov. Nemuro: Ochiishi. *Kuriles*:- Shikotan: Shakotan.

On *Ledum palustre* L. var. *nipponicum* Nakai (*Isotsutsuji*). *Hokkaidô*:- Prov. Ishikari: Horomui. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Ledum palustre* L. var. *yesoense* Nakai (*Yezo-isotsutsuji*). *Hokkaidô*:- Prov. Iburi: Noboribetsu. Prov. Ishikari: Mt. Kuro-dake; Hakuun-sawa (*Daisetsuzan*). Prov. Kitami: Otatomari (*Rishiri*).

78. **Chrysomyxa ledicola** Lagerheim (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 35, 1927; Jap. Jour. Bot. III, p. 315, 1927; Bot. Mag. Tokyo, XLIII, p. 469, 1929; Bot. & Zool. II, p. 548, 1934).

On *Ledum palustre* L. var. *procumbens* Ait. (*Hime-isotsutsuji*). *Hokkaidô*:- Prov. Ishikari: Mt. Hokkai-dake; Mt. Hakuun-dake; Mt. Kuro-dake; Kumonotaira (*Daisetsuzan*).

79. **Cronartium kamtschaticum** Jørstad. Syn. *Peridermium kurilense* Dietel in Engl. Bot. Jahrb. XXXVII, p. 107, 1905. (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (11), 1929). *Cronartium Pedicularis* (not Lindr.) (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. II, p. 244, 1931; Bot. & Zool. II, p. 544, 545 & 546, 1934).

On *Pinus pumila* Rgl. (*Hai-matsu*). *Kuriles*:- Shumushu. *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Kumonotaira (*Daisetsuzan*). *Honshû*:- Prov. Shinano: Mt. On-take.

On *Pedicularis japonica* Miq. (*Yotsuba-shiogama*). *Honshû*:- Prov. Shinano: Mt. On-take.

On *Pedicularis Oederi* Vahl. (*Chishima-shiogama*). *Hokkaidô*:- Prov. Ishikari: Hakuun-sawa (*Daisetsuzan*).

On *Pedicularis jezoensis* Maxim. (*Yezo-shiogama*). *S. Saghalien*:- Shikotan. *Honshû*:- Prov. Shinano: Mt. Tsubakuro-dake.

80. **Coleosporium Cacaliae** Otth. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 236, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (12), 1929; Mem. Tottori Agric. Coll. I, p. 89, 1930; Transact. Tottori Soc. Agric. Sci. IV, p. 42, 1932; Bot. & Zool. II, p. 544, 1934; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 272, 1927; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 239, 1931; Nagai & Shimamura in Jour. Soc. Agric. & Forestr. Sapporo, XXV, p. 85, 1933; Sydow in Ann. Myc. XII, p. 160, 1914; Togashi in Jap. Jour. Bot. II, p. 92, 1924; Togashi & Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 32, 1934).

On *Pinus pumila* Rgl. (*Hai-matsu*). *S. Saghalien*:- Mt. Tosso.

On *Cacalia adenostyloides* Franch. et Sav. (*Kani-kômor*). *Honshû*:- Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Hayachine. Prov. Shinano: Mt. Komagatake (*Kiso*). Prov. Hôki: Mt. Daisen.

On *Cacalia auriculata* DC. var. *kamtschatica* Maxim. (*Mimi-kômor*). *Hokkaidô*:- Prov. Kushiro: Mt. Oakan-dake; Shirikomabetsu (*Akan*). Prov. Kitami: Uennai (*Rebun*). *Kuriles*:- Kunashiri: Mt. Chacha-nupuri.

On *Cacalia auriculata* DC. var. *ochotensis* Maxim. (*Karafuto-mimi-kômor*). *S. Saghalien*:- Mt. Tosso; Mt. Kashipo; Mt. Nupuripo.

On *Cacalia delfinifolia* Sieb. et. Zucc. (*Momijigasa*). *Hokkaidô*:- Prov. Hidaka: Urakawa. *Honshû*:- Prov. Shinano: Nojiri. *Shikoku*:- Prov. Tosa: Mt. Kamuri.

On *Cacalia farfaraefolia* Sieb. et. Zucc. var. *farfaraefolia* Maxim. (*Miyama-kômor*). *Hokkaidô*:- Prov. Kitami: Rishiri Isl. *Honshû*:- Prov. Mutsu: Mt. Hakkôda.

On *Cacalia hastata* L. var. *glabra* Ledeb. (*Yobusuma-sô*). *S. Saghalien*:- Ambetsu. *Hokkaidô*:- Prov. Kitami: Rebun Isl.

On *Cacalia hastata* L. var. *pubescens* Ledeb. (*Urage-yobusuma-sô*). *S. Saghalien*:- Takinosawa (*Noboripo*). *Kuriles*:- Kunashiri: Nikishiro.

On *Cacalia Kramerii* Matsum. (*Yabure-gasa*). *Korea*:- Prov. Kôgen:

Shinkeiji (Soto-Kongô); Onseirei (Soto-Kongô).

81. **Coleosporium Fauriae** Sydow in Ann. Myc. XII, p. 160, 1914. (Hiratsuka, f. in Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (13), 1929; Ito & Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 271, 1927).

On *Fauria Crista-Galli* Mak. (*Iwa-ichô*). *Hokkaidô*:- Prov. Ishikari: Mt. Tomuraushi; Mt. Yûbari-dake. *Kuriles*:- Etorofu: Shana; Shibetoro; Mt. Moyoro. *Honshû*:- Prov. Mutsu: Mt. Hakkôda. Prov. Rikuchû: Mt. Yakeishi-dake; Mt. Sukawa-dake. Prov. Ugo: Mt. Komagatake.

82. **Coleosporium Ligulariae** Thümen (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 237, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (12), 1929; Mem. Tottori Agric. Coll. I, p. 89, 1930; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 239, 1931; Togashi in Jap. Jour. Bot. II, p. 92, 1924).

On *Ligularia calthaeifolia* Maxim. (*Takarakô*). *S. Saghalien*:- Mt. Kashipo; Akashiki. *Hokkaidô*:- Prov. Nemuro: Ochiishi. Prov. Kitami: Oshidomari (Rishiri); Momoiwa (Rebun). *Kuriles*:- Urup: Tokotan.

On *Ligularia Hodgsoni* Hook. (*Tôgebuki*). *Hokkaidô*:- Prov. Kushiro: Mt. Meakan-dake; Nanamagari (Akan).

On *Ligularia sibirica* Cass. (*O-takarakô*). *Kuriles*:- Etorofu. *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Ligularia sibirica* Cass. var. *speciosa* DC. (*Oni-otakarakô*). *S. Saghalien*:- Mt. Tosso; Kashipo.

On *Ligularia stenocephala* Matsum. et Koidz. (*Me-takarakô*). *Shikoku*:- Prov. Awa: Mt. Tsurugi.

On *Ligularia stenocephala* Matsum. et Koidz. var. *typica* Matsum. et Koidz. (*Miyama-me-takarakô*). *Formosa*:- Prov. Taihoku: Mt. Nanko (Bunakkei).

On *Ligularia tussilaginea* Mak. var. *formosana* Hayata (*Taiwantsuwabuki*). *Formosa*:- Prov. Tainan: Mt. Arisan.

83. **Coleosporium Saussureae** Thümen (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 222, 1927; Jour. Soc. Agric. & Forestr. Sapporo, XXI, (no. 95), p. (11), 1929; Mem. Tottori Agric. Coll. I, p. 89, 1930; Bot. & Zool. II, p. 546, 1934; Jour. Jap. Bot. XI, p. 283, 1935; Kawai & Otani in Transact. Sapporo Nat. Hist. Soc. XI, p. 239, 1931; Naito & Yagi in Transact. Nat. Hist. Soc. Kagoshima Imp. Coll. Agric. & Forestr., no. 11, p. 23, 1933; Togashi

& Onuma in Bull. Imp. Coll. Agric. & Forestr. Morioka, XVII, p. 33, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930). Syn. *Uredo Compositarum* (not Dietel) (Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901). *Coleosporium Saussureae* Dietel in Engl. Bot. Jahrb. XXXIV, p. 588, 1905. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 107, 1905; Ann. Myc. VI, p. 228, 1908; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (30), 1905).

On *Pinus pumila* Rgl. (*Hai-matsu*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake.

On *Saussurea acuminata* Turcz. (*Tonakai-azami*). *S. Saghalien*:- Mt. Kashipo.

On *Saussurea gracilis* Maxim. (*Hokuchi-azami*). *Shikoku*:- Prov. Iyo: Idzushi-yama.

On *Saussurea grandifolia* Maxim. (*Shirane-azami*). *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Saussurea japonica* DC. (*Hime-higotai*). *Honshû*:- Prov. Rikuchû: Barajima; Hakomine. *Shikoku*:- Prov. Tosa: Kamoda-mura; Hatayama-mura; Hada-mura; Hage-mura; Kagami-mura. *Kiushû*:- Prov. Hiuga: Mt. Kirishima. Prov. Ôsumi: Mt. Takakuma.

On *Saussurea manshurica* Kom. (*Yanone-azami*). *S. Saghalien*:- Akashiki; Ambetsu; Mt. Shiritori.

On *Saussurea Maximowiczii* Herd. (*Miyako-azami*). *Honshû*:- Prov. Shimotsuke: Nikkô.

On *Saussurea nambuana* Koidz. (*Nagaba-kita-azami*). *Honshû*:- Prov. Rikuchû: Mt. Hayachine.

On *Saussurea nupuripoensis* Miyabe et T. Miyake (*Nupuripo-azami*). *S. Saghalien*:- Mt. Tosso; Kita-Nayoshi.

On *Saussurea Riederi* Herd. (*Kita-azami*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake; Goshiki-daira (Daisetsuzan); Yukinosawa (Daisetsuzan); Mt. Nisekaushipe. *Kuriles*:- Urup: Tokotan.

On *Saussurea sachalinensis* Fr. Schm. (*Karafuto-azami*). *S. Saghalien*:- Mt. Tosso.

On *Saussurea sagittata* Franch. (*Yahadzu-tôhiren*). *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Saussurea Tanakae* Franch. et. Sav. (*Tôhiren*). *Honshû*:- Prov. Rikuchû: Mt. Iwate.

On *Saussurea Tilesii* Ledeb. var. *nivea* Koidz. (*Yukiba-tôhiren*). *Hokkaidô*:- Prov. Ishikari: Mt. Kuro-dake.

On *Saussurea Yoshinagai* Kitagawa (*Yama-higotai*). *Shikoku*:- Prov.

Tosa: Hada-mura.

On *Saussurea* sp. Honshû:- Prov. Shinano: Mt. Komagatake(Kiso).

On *Saussurea* sp. Honshû:- Prov. Idzu: Kawana.

On *Saussurea* sp. Korea:- Prov. Kôgen: Bishamon (Soto-Kogô).

TABLE 20

Number of species of rust fungi found in the alpine regions of mountains in different districts of Japan

Districts Genera	S. Sagha- lien	Hokkai- dô	Kuriles	Honshû	Shikoku & Kiushû	Korea	Formosa
Uromyces	8	9	7	9	2	2	2
Puccinia	18	28	10	36	11	6	8
Phragmidium	3	4	1	4	1	1	—
Gymnosporangium	—	—	—	1	—	—	—
Xenodochus	2	2	1	1	—	—	—
Gymnoconia	1	1	—	—	—	—	—
Melampsora	1	1	1	1	—	1	1
Chnoospora	1	1	1	1	1	—	1
Melampsorella	1	1	1	1	1	1	—
Melampsidium	1	1	—	1	1	—	—
Pucciniastrum	1	1	1	1	—	—	1
Thekopsora	3	4	3	4	1	—	—
Hyalopsora	1	1	1	1	1	1	1
Uredinopsis	1	1	1	1	—	—	—
Calyptospora	1	1	1	1	—	—	—
Chrysomyxa	3	5	2	4	—	—	1
Cronartium	1	1	1	1	—	—	—
Coleosporium	3	4	4	4	3	2	1
Total	50	66	36	72	21	14	11

The 83 species also may be formed into the following three groups; 1) Alpine species which are chiefly restricted to the alpine regions, 2) Arctic-alpine species which are found in the alpine regions and also in the arctic region, and 3) Species which have been also found in the lowlands of Honshû and Hokkaidô.

1. Alpine species ~ *Uromyces amoenus* Syd., *U. Cacaliae* (DC.) Unger, *U. Miurae* Syd., *U. Solidaginis* (Sommerf.) Niessl, *U. yatsugatakense*

Hirats. f., *Puccinia alpina* Fuck., *P. Campanulae* Carmich., *P. cuneata* Diet., *P. Epilobii* DC., *P. iwateyamensis* Hirats. f., *P. melanoplaca* Syd., *P. melasmoides* Tranzsch., *P. nitidula* Tranzsch., *P. Pulsatillae* Kalchbr., *P. Ribis-japonici* P. Henn., *P. Schizocodonis* Pat., *P. sibirica* Tranzsch., *P. Togashiana* Hirats. f., *P. Tokunagai* Ito et Kawai, *P. Trautvetteriae* Syd. et Holw., *P. vesiculosa* Schlecht., *P. Viola-glabbellae* Miura, *P. vomica* Thüm., *Phragmidium alpinum* Hirats. f., *Ph. Itoanum* Hirats. f., *Ph. Miyabeum* Ito et Hirats. f., *Gymnosporangium nipponicum* Yamada, *Thekopsora sparsa* (Wint.) P. Magn. and *Chrysomyxa alpina* Hirats. f. Among these species, there are the following 13 species which have been found only within the confines of the alpine regions of our country. They are: *Uromyces yatsugatakense* Hirats. f., *Puccinia cuneata* Diet., *P. iwateyamensis* Hirats. f., *P. melanoplaca* Syd., *P. Ribis-japonici* P. Henn., *P. Schizocodonis* Pat., *P. Togashiana* Hirats. f., *P. Tokunagai* Ito et Kawai, *P. Viola-glabbellae* Miura, *Phragmidium alpinum* Hirats. f., *Ph. Itoanum* Hirats. f., *Ph. Miyabeum* Ito et Hirats. f. and *Gymnosporangium nipponicum* Yamada.

2. Arctic-alpine species ~ *Uromyces Geranii* (DC.) Fr., *U. Hedysari-obscuri* (DC.) Carest. et Picc., *Puccinia Bistortae* DC., *P. Circaeae* Pers., *P. Fergussoni* Berk. et Br., *P. Gymnantrae* Tranzsch., *P. Hultenii* Tranzsch., et Jôrstad, *P. Majanthemi* Diet., *P. Polygoni-Weyrichii* T. Miyake, *P. porphyrogenita* Curt., *P. rhytismoides* Johan., *P. Saxifragae* Schlecht., *P. Veronicarum* DC., *Xenodochus minor* Arth., *Gymnoconia Peckiana* (Howe) Trotter, *Thekopsora Myrtillina* Karst., *Chrysomyxa Empetri* Schrôt., *Ch. Ledi* De Bary, *Ch. ledicola* Lagerh., *Cronartium kamschatiticum* Jôrstad and *Coleosporium Cacaliae* Otth.

3. The other species collected in the alpine regions have also been found in the lowlands of Honshû and Hokkaidô.

II. Distribution of species in other regions of the world

It is an interesting matter to compare the rust-flora in the alpine regions of Japan with that of other regions in the world and to consider their relations. Before proceeding further in the discussion of the subject, it is necessary to consider the geographical distribution of the species. The following table indicates the relationships of the rust-flora of the alpine regions of mountains in our country to those of other regions in the world.

TABLE 21

Geographical distribution of species of rust fungi found in the alpine regions of mountains in Japan

Species	Regions												
	Japan	Manchuria, Mongolia & N. China	Southern China & Philippines	Himalaya	N. Saghalien & Coast Province of E. Siberia	Kamchatka	Siberia	Europe	Alaska & Canada	United States of America	South America	Africa	Australia & New Zealand
<i>Uromyces amoenus</i>	+	-	-	-	-	-	-	+	+				
<i>U. Cacaliae</i>	+	-	-	-	-	+	+	+					
<i>U. Geranii</i>	+	+	-	-	+	+	+	+	+				
<i>U. Hedysari-obscuri</i>	+	+	-	+	+	+	+	+	+				
<i>U. japonicus</i>	+	+	-	-	-	+	+	+					
<i>U. Miurae</i>	+	-	-	-	-	-	-	-	+				
<i>U. Peracarpae</i>	+												
<i>U. Rudbeckiae</i>	+	+	-	-	-	-	-	-	+				
<i>U. Solidaginis</i>	+	+	-	-	-	+	+	+	+				
<i>U. Veratri</i>	+	+	-	-	-	+	+	+					
<i>U. yatsugatakense</i>	+												
<i>Puccinia alpina</i>	+	-	-	-	-	+	+	+					
<i>P. asiatica</i>	+	+											
<i>P. Bistortae</i>	+	-	-	-	-	+	+	+	+				
<i>P. calthaeicola</i>	+	-	-	-	-	-	+	+	+				
<i>P. calumnata</i>	+												
<i>P. Campanulae</i>	+	-	-	-	-	-	+	+	+				
<i>P. Circaeae</i>	+	-	-	+	-	+	+	+	+				
<i>P. cuneata</i>	+												
<i>P. Epilobii</i>	+	-	-	-	-	-	-	+	+	+			
<i>P. Fergussoni</i>	+	-	-	-	-	+	+	+	+				
<i>P. ferruginosa</i>	+	+	-	+	+	+							
<i>P. Funkiae</i>	+	+											
<i>P. Gymnandrae</i>	+	+	-	-	-	+	+						
<i>P. Hieracii</i>	+	+	+	+	-	+	+	+	+	+	+	+	+
<i>P. Hultenii</i>	+	-	-	-	+	+							
<i>P. iwateyamensis</i>	+												
<i>P. Lactucae</i>	+	+											

TABLE 21 (Continued)

Species	Regions												
	Japan	Manchuria, Mongolia & N. China	Southern China & Philippines	Himalaya	N. Saghalien & Coast Province of E. Siberia	Kamchatka	Siberia	Europe	Alaska & Canada	United States of America	South America	Africa	Australia & New Zealand
<i>P. Majanthemi</i>	+	-	-	-	-	+							
<i>P. melanoplaca</i>	+												
<i>P. melasmioides</i>	+												
<i>P. Metanartheccii</i>	+												
<i>P. Nanbuana</i>	+	+	-	-	+								
<i>P. nitidula</i>	+	+	-	-	-	-	+	+					
<i>P. pachycephala</i>	+												
<i>P. Polygoni-Weyrichii</i>	+												
<i>P. porphyrogenita</i>	+	-	-	-	+	-	-	-	+	+			
<i>P. Pulsatillae</i>	+	-	-	+	-	-	-	+	+	+			
<i>P. rhytismoides</i>	+	-	-	-	-	-	-	+					
<i>P. Ribis-japonici</i>	+												
<i>P. Saxifragae</i>	+	-	-	-	-	+	+	+	+	+			
<i>P. Schizocodonis</i>	+												
<i>P. sibirica</i>	+	-	-	-	-	-	+						
<i>P. Togashiana</i>	+												
<i>P. Tokunagai</i>	+												
<i>P. Trautvetteriae</i>	+	-	-	-	+	-	-	-	-	+			
<i>P. Veronicarum</i>	+	-	-	-	-	-	-	+	+	+			
<i>P. vesiculosa</i>	+	-	-	-	-	-	+						
<i>P. Viola</i>	+	+	-	+	-	-	+	+	+	+	+	+	+
<i>P. Violae-glabellae</i>	+												
<i>P. Virgaureae</i>	+	-	-	-	-	-	-	+	+	+			
<i>P. vomica</i>	+	-	-	-	-	-	+						
<i>Phragmidium alpinum</i>	+												
<i>Ph. fusiforme</i>	+	-	-	-	-	+	+	+	+	+			
<i>Ph. Itoanum</i>	+												
<i>Ph. Miyabeaenum</i>	+												
<i>Ph. Potentillae</i>	+	+	-	+	-	-	+	+	+	+			
<i>Gymnosporangium nipponicum</i>	+												

TABLE 21 (Continued)

Species	Regions												
	Japan	Manchuria, Mongolia & N. China	Southern China & Philippines	Himalaya	N. Saghalien & Coast Province of E. Siberia	Kamchatka	Siberia	Europe	Alaska & Canada	United States of America	South America	Africa	Australia & New Zealand
<i>Xenodochus carbonarius</i>	+	+	-	-	-	+	+	+					
<i>X. minor</i>	+	-	-	-	-	-	-	+					
<i>Gymnoconia Peckiana</i>	+	+	-	+	-	+	+	+	+				
<i>Melampsora Kusanoi</i>	+	+	-	-	+	-	+	+	-	-	-	-	+
<i>Chnoopsora Itoana</i>	+	-	-	-	+								
<i>Melampsorella Caryophyllacearum</i>	+	-	-	-	+	-	+	+	+	+			
<i>Melampsorium Alni</i>	+	-	-	-	-	-	+						
<i>Pucciniastrum Pyrolae</i>	+	-	-	-	+	+	+	+	+	+			
<i>Thekopsora Myrtilina</i>	+	-	-	-	-	+	+	+	+	+			
<i>Th. sparsa</i>	+	-	-	-	-	-	-	+	+	+			
<i>Th. Tripetaleiae</i>	+												
<i>Th. Vacciniorum</i>	+	-	-	-	-	+	+	+					
<i>Hyalopsora Polypodii</i>	+	-	-	-	-	-	+	+	+	+			
<i>Uredinopsis filicina</i>	+	+	-	-	-	-	+	+					
<i>Calyptospora Goeppertiana</i>	+	-	-	-	+	-	+	+	+	+			
<i>Chrysomyxa alpina</i>	+	-	-	-	+	+							
<i>Ch. Empetri</i>	+	-	-	-	-	-	+	+	+	+			
<i>Ch. expansa</i>	+												
<i>Ch. Ledi</i>	+	-	-	-	-	-	+	+	+	+			
<i>Ch. ledicola</i>	+	-	-	-	-	+	-	-	+	+			
<i>Cronartium kamtschaticum</i>	+	-	-	-	-	+							
<i>Coleosporium Cacaliae</i>	+	-	-	-	-	+	+	+					
<i>C. Fauriae</i>	+												
<i>C. Ligulariae</i>	+	-	-	-	-	-	+	+					
<i>C. Saussureae</i>	+	+	-	-	+	+	+						
Total	83	21	1	8	14	27	38	38	30	31	2	2	2

III. Geographical elements of rust-flora in the alpine regions of mountains in Japan

Based upon the data in the preceding paragraphs the rust-flora in the alpine regions of this country may be classified in six groups. They are: 1) Cosmopolite elements, 2) Circumpolar elements, 3) European and Eastern Asiatic elements, 4) Siberian and Eastern Asiatic elements, 5) American and Eastern Asiatic elements and 6) Eastern Asiatic elements.

1. Cosmopolite elements ~ These elements are represented by the following three species; *Puccinia Hieracii* (Schum.) Mart., *P. Violae* (Schum.) DC. and *Melampsora Kusanoi* Diet.

2. Circumpolar elements ~ These elements are here represented by as many as 25 species, or 30.12 per cent of the whole number. They are: *Uromyces Geranii* (DC.) Fr., *U. Hedysari-obscuri* (DC.) Carest. et Picc., *U. Solidaginis* (Sommerf.) Niessl, *Puccinia Bistortae* DC., *P. calthaeicola* Schröt., *P. Campanulae* Carmich., *P. Circaeae* Pers., *P. Epilobii* DC., *P. Fergussoni* Berk. et Br., *P. Pulsatillae* Kalchbr., *P. Saxifragae* Schlecht., *P. Veronicarum* DC., *Phragmidium fusiforme* Schröt., *Ph. Potentillae* (Pers.) Karst., *Gymnoconia Peckiana* (Howe) Trott., *Melampsorella Caryophyllacearum* Schröt., *Pucciniastrum Pyrolae* (Karst.) Schröt., *Thekopsora Myrtilina* Karst., *Th. sparsa* (Wint.) P. Magn., *Th. Vacciniorum* Karst., *Hyalopsora Polypodii* (Diet.) P. Magn., *Calyptospora Goeppertiana* Kühn, *Chrysomyxa Empetri* Schröt., *Ch. Ledi* De Bary and *Ch. ledicola* Lagerh.

3. European and Eastern Asiatic elements ~ They are represented by the following 11 species; *Uromyces Cacaliae* (DC.) Unger, *U. japonicus* Berk. et Curt., *U. Veratri* (DC.) Schröt., *Puccinia alpina* Fuck., *P. nitidula* Tranzsch., *P. rhytismoides* Johans., *P. Virgaureae* (DC.) Libert, *Xenodochus carbonarius* Schlecht., *Uredinopsis filicina* (Niessl) P. Magn., *Coleosporium Cacaliae* Otth and *C. Ligulariae* Thüm.

4. Siberian and Eastern Asiatic elements ~ These elements are represented by the following eight species; *Puccinia asiatica* (Kom.) Syd., *P. Gymnandrae* Tranzsch., *P. melasmoides* Tranzsch., *P. sibirica* Tranzsch., *P. vesiculosa* Schlecht., *P. vomica* Thüm., *Melampsorium Alni* (Thüm.) Diet. and *Coleosporium Saussureae* Thüm.

5. American and Eastern Asiatic elements ~ They are represented by the following six species; *Uromyces amoenus* Syd., *U. Miurae* Syd., *U. Rudbeckiae* Arth. et Holw., *Puccinia porphyrogenita* Curt., *P. Trautvetteriae* Syd. et Holw. and *Xenodochus minor* Arth.

6. Eastern Asiatic elements ~ These elements comprise in all 30 species or 36.14 per cent of the whole number. Further, they are divided as follows:-

a) *Elements of Kamchatka, Coast Province of E. Siberia, North Saghalien and Japan* ~ This group is represented by the following five species; *Puccinia Hultenii* Tranzsch. et Jørstad, *P. Majanthemi* Diet., *Chnoospora Itoana* Hirats. f., *Chrysomyxa alpina* Hirats. f. and *Cronartium kamschaticum* Jørstad.

b) *Elements of Manchuria, Korea and Japan* ~ These elements are represented by the four species; *Puccinia ferruginosa* Syd., *P. Funkiae* Diet., *P. Lactucae* Diet. and *P. Nanbuana* P. Henn.

c) *Endemic species* ~ To our present knowledge there is a total of 21 species endemic to Japan, or 25.30 per cent of the total number.

Species peculiar to South Saghalien: *Puccinia Tokunagai* Ito et Kawai.

Species peculiar to South Saghalien, Hokkaidō, the Kuriles and Honshū: *Puccinia Polygoni-Weyrichii* T. Miyake.

Species peculiar to South Saghalien, Hokkaidō and Honshū: *Uromyces Peracarpae* Ito et Tochinai, *Puccinia calumnata* Syd., *Phragmidium alpinum* Hirats. f., *Ph. Itoanum* Hirats. f. and *Ph. Miyabeanum* Ito et Hirats. f.

Species peculiar to Hokkaidō and Honshū: *Puccinia melanoplaca* Syd., *P. Violae-glabellae* Miura and *Thekopsora Tripetaleiae* Hirats. f.

Species peculiar to Hokkaidō, Honshū and Shikoku: *Puccinia Metanarthecei* Pat., *P. pachycephala* Diet. and *P. Ribis-japonici* P. Henn.

Species peculiar to Hokkaidō, the Kuriles and Honshū: *Coleosporium Fauriae* Syd.

Species peculiar to Hokkaidō, Honshū and Formosa: *Chrysomyxa expansa* Diet.

Species peculiar to Honshū: *Uromyces yatsugatakense* Hirats. f., *Puccinia cuneata* Diet., *P. iwateyamensis* Hirats. f., *P. Schizocodonis* Pat., *P. Togashiana* Hirats. f. and *Gymnosporangium nipponicum* Yamada.

IV. Rust-flora of the alpine regions of mountains in Japan compared with that of the same regions in Switzerland

The district whose alpine flora of the rust fungi has been best explored in the world is Switzerland in Central Europe. The writer made comparison of the rust-flora of the alpine regions of our

country and that of the same regions in Switzerland, mainly based upon data from Fischer's, "Die Uredineen der Schweiz".

Among 83 species of rust fungi, found in the alpine regions of Japan, the following 18 species or 21.69 per cent of the whole have also been found in the corresponding regions of Switzerland. They are: *Uromyces Cacaliae* (DC.) Unger, *U. Hedysari-obscuri* (DC.) Carest. et Picc., *U. japonicus* Berk. et Curt., *U. Solidaginis* (Sommerf.) Niessl, *U. Veratri* (DC.) Schröt., *Puccinia alpina* Fuck., *P. Bistortae* DC., *P. Epilobii* DC., *P. Hieracii* (Schum.) Mart., *P. Pulsatillae* Kalchbr. *P. Saxifragae* Schlecht., *P. Violae* (Schum.) DC., *P. Virgaureae* (DC.) Libert, *Phragmidium fusiforme* Schröt., *Melampsorella Caryophyllacearum* Schröt., *Thekopsora sparsa* (Wint.) P. Magn., *Chrysomyxa Empetri* Schröt. and *Coleosporium Cacaliae* Otth.

The following 15 species found in the alpine regions of our country have never been recorded from similar regions in Switzerland, but, they have been collected in other regions below the timber-line. They are: *Uromyces Geranii* (DC.) Fr., *Puccinia calthaeicola* Schröt., *P. Campanulae* Carmich., *P. Circaeae* Pers., *P. Veronicarum* DC., *Phragmidium Potentillae* (Pers.) Karst., *Xenodochus carbonarius* Schlecht., *Gymnoconia Peckiana* (Howe) Trott., *Pucciniastrum Pyrolae* (Karst.) Schröt., *Thekopsora Myrtilina* Karst., *Th. Vacciniorum* Karst., *Hyalopsora Polypodii* (Diet.) P. Magn., *Uredinopsis filicina* (Niessl) P. Magn., *Calypsoptora Goepfertiana* Kühn and *Chrysomyxa Ledi* De Bary.

The following 14 species found in the alpine regions of Switzerland have never been collected in the like regions in our country, but, they have been in other regions in our territories; *Uromyces Aconiti-Lycoctoni* (DC.) Wint., *U. Armeriae* (Schlecht.) Lév., *U. Loti* Blytt. (*Uromyces Euphorbiae-Corniculati* Jord), *Puccinia Baryi* (Berk. et Br.) Wint., *P. Carduorum* Jacky, *P. Cirsii* Lasch, *P. albulensis* (Grev.) Plowr., *P. Arenariae* (Schum.) Wint., *P. Agrostidis* Plowr., *P. Veratri* Duby, *Melampsora Larici-epitea* Kleb., *M. Lini* (Desm.) Lév., *Chrysomyxa Rhododendri* De Bary and *Coleosporium Senecionis* Fr.

GENERAL SUMMARY

In the present paper, the writer has reported his studies on the rust-flora of the alpine regions of high mountains in South Saghalien, Hokkaidô and Honshû in Japan. The results may be summarized as follows:-

1. There are 33 species found in the alpine regions of Daise-tszan mountain group (prov. Ishikari, Hokkaidô), 31 species in the same regions of Mt. Iwate (prov. Rikuchû, northern Honshû), 26 species in the same regions of Yatsugatake mountain range (prov. Shinano, middle Honshû), 32 species in the same regions of Mt. Tsubakuro-dake (prov. Shinano, middle Honshû), 34 species in the same regions of Mt. Komagatake (Kiso) (prov. Shinano, middle Honshû), and 14 species in the other mountains of South Saghalien, Hokkaidô and Honshû. The total number of species is 83.

2. The number of microcyclic species increases relatively from south to north in our territories.

3. The number of microcyclic species is greater in the alpine regions than at the mountain foot.

4. The number of microsporic forms of microcyclic species is greater in the alpine regions than at the mountain foot.

5. There is a correlation between the lower air temperatures and the relative increase of microcyclic species towards the north and in the regions of high altitude.

6. The rust-flora of the alpine regions of high mountains in South Saghalien, Hokkaidô and Honshû is made up largely of groups composed of widely ranging species. The largest and most important elements are circumpolar.

7. Among 83 species found in the alpine regions of high mountains in South Saghalien, Hokkaidô and Honshû, 18 species or 21.69 per cent of the whole have also been found in similar regions of Switzerland in Central Europe; 15 species have ever been recorded from the alpine regions in Switzerland, but they have been collected in other regions below timber-line. There are 14 species found in the alpine regions of Switzerland which have never been collected in the alpine regions in this country, but they have found in other regions in Japanese territory.

8. Four species; *Uromyces yatsugatakense* Hiratsuka, f., *Puccinia iwateyamensis* Hiratsuka, f., *P. Togashiana* Hiratsuka, f. and *Gymno-*

sporangium nipponicum Yamada were described as new to science.

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Fungus index

(Synonyms and species incidentally mentioned in *italic type*)

	Page
<i>Blastospora Itoana</i> Togashi et Onuma	139
<i>Calypsotheca columnare</i> Kühn	216
<i>C. Goeppertiana</i> Kühn - 131, 137, 146, 150, 152, 156, 158, 168, 171, 216, 226, 227, 229	
<i>Chnoospora Itoana</i> Hirats. f. - 131, 136, 144, 150, 156, 168, 171, 182, 183, 208, 226, 228	
<i>Chrysomyxa alpina</i> Hirats. f. ----- 131, 137, 146, 150, 168, 171, 216, 223, 226, 228	
<i>Ch. Empetri</i> Schröt. - 130, 137, 146, 150, 152, 156, 158, 168, 171, 216, 223, 226, 227, 229	
<i>Ch. expansa</i> Diet. ----- 146, 151, 158, 168, 171, 217, 226, 228	
<i>Ch. expansa</i> (not Diet.)	216
<i>Ch. Ledi</i> De Bary ----- 130, 137, 145, 168, 171, 217, 223, 226, 227, 229	
<i>Ch. ledicola</i> Lagerh. ----- 130, 138, 168, 171, 218, 223, 226, 227	
<i>Ch. Rhododendri</i> De Bary	229
<i>Coleosporium Caecaliae</i> Otth. ----- 146, 151, 158, 168, 171, 219, 223, 226, 227, 229	
<i>C. Fauriae</i> Syd. ----- 165, 168, 171, 220, 226, 228	
<i>C. Ligulariae</i> Thüm. ----- 145, 158, 168, 171, 220, 226, 227	
<i>C. Saussureae</i> Diet. ----- 221	
<i>C. Saussureae</i> Thüm. ----- 131, 138, 139, 145, 168, 171, 220, 226, 227	
<i>C. Senecionis</i> Fr. ----- 229	
<i>Cronartium kamtschaticum</i> Jorstad - 131, 138, 152, 156, 158, 168, 171, 218, 223, 226, 228	
<i>C. Pedicularis</i> (not Lindr.)	157, 218
<i>Gymnoconia interstitialis</i> Lagerh.	206
<i>G. Peckiana</i> (Howe) Trott. ----- 165, 168, 170, 206, 223, 226, 227, 229	
<i>Gymnosporangium Haraeae</i> Syd.	144
<i>G. nipponicum</i> Yamada ----- 143, 167, 171, 205, 223, 225, 228, 230	
<i>Hyalospora aculeata</i> Kamei ----- 146, 156	
<i>H. Asplenii</i> - <i>Wichurizae</i> Diet.	215
<i>F. filicum</i> Diet.	214
<i>H. hakodatensis</i> Hirats. f.	131
<i>H. Polypodii</i> (Diet.) P. Magn. ----- 157, 168, 171, 214, 226, 227, 229	
<i>H. Yamadana</i> Hirats. f.	131
<i>Melampsora Alni</i> Thüm.	210
<i>M. Hypericorum</i> (not Schröt.)	207
<i>M. Kusanoi</i> Diet. ----- 131, 135, 156, 168, 170, 207, 226	
<i>M. Larici-epitea</i> Kleb.	131, 229
<i>M. Lini</i> (Desm.) Lév.	229
<i>Melampsorella Caryophyllacearum</i> Schröt. 131, 144, 168, 171, 208, 226, 227, 229	
<i>M. Cerastii</i> Wint.	209
<i>M. elatina</i> Arth.	209
<i>Melampsoridium Alni</i> (Thüm.) Diet. 144, 168, 171, 210, 226	
<i>M. Alni-firmae</i> Hirats. f.	210
<i>M. Alni-pendulae</i> Hirats. f.	210

	Page
<i>Milesina jezoensis</i> Kamei et Hirats. f.	131
<i>Phragmidium alpinum</i> Hirats. f. - { 131, 135, 146, 150, 152, 155, 158, 168, 171, 181	
..... 183, 204, 223, 225, 228	
<i>Ph. carbonarium</i> (Schlecht.) Wint.	143, 206
<i>Ph. fusiforme</i> Schröt.	165, 168, 170, 204, 225, 227, 229
<i>Ph. griseum</i> Diet.	146
<i>Ph. Itoanum</i> Hirats. f. - 131, 135, 146, 150, 152, 156, 158, 168, 170, 204, 223, 225, 228	
<i>Ph. Miyabeae</i> Ito et Hirats. f. - 131, 135, 152, 156, 158, 168, 171, 183, 205, 223, 225, 228	
<i>Ph. Nambuianum</i> Diet.	131
<i>Ph. pauciloculare</i> (Diet.) Syd.	131
<i>Ph. Potentillae</i> (Pers.) Karst.	165, 168, 170, 205, 225, 227, 229
<i>Ph. Rosae-acicularis</i> Liro	204
<i>Ph. Rosae-multiflorae</i> Diet.	139
<i>Ph. Rubi-Idaei</i> (DC.) Karst.	131
<i>Ph. Rubi-japonici</i> Kasai	131, 139
<i>Puccinia acuminata</i> Peck	199
<i>P. Adenophorae</i> Diet.	151
<i>P. Adoxae</i> Hedw. f.	130, 183
<i>P. Agrostidis</i> Plowr.	229
<i>P. albulensis</i> (Grev.) Plowr.	229
<i>P. alpina</i> Fuck. ----- 146, 148, 151, 153, 157, 166, 171, 181, 189, 223, 224, 227, 229	
<i>P. Angelicae</i> (not Fuck.)	198
<i>P. Angelicae-edulis</i> T. Miyake	139, 197, 198
<i>P. Arenariae</i> (Schüm.) Wint.	229
<i>P. asarina</i> Kunze	151
<i>P. asiatica</i> (Kom.) Syd. ----- 130, 140, 146, 151, 166, 171, 182, 183, 189, 224, 227	
<i>P. Baryi</i> (Berk. et Br.) Wint.	229
<i>P. Bistortae</i> DC.	152, 153, 166, 170, 189, 223, 224, 227, 229
<i>P. bullata</i> (not Schröt.)	197
<i>P. calthaeicola</i> Schröt.	132, 166, 170, 190, 224, 227, 229
<i>P. calumnata</i> Syd.	130, 132, 152, 153, 157, 166, 170, 190, 224, 228
<i>P. Campanulae</i> Carmich. ----- 130, 132, 140, 166, 171, 183, 191, 223, 224, 227, 229	
<i>P. Carduorum</i> Jacky	229
<i>P. Chrysosplenii</i> Grev.	130, 182, 183
<i>P. Circaeae</i> Pers. - 131, 133, 148, 151, 153, 157, 166, 171, 182, 183, 191, 223, 224, 227, 229	
<i>P. Cirsii</i> Lasch.	229
<i>P. cuneata</i> Diet.	151, 153, 166, 171, 191, 223, 224, 228
<i>P. Epilobii</i> DC.	131, 133, 166, 171, 183, 191, 223, 224, 227, 229
<i>P. exhausta</i> Diet.	151
<i>P. Fergussoni</i> Berk. et Br.	164, 166, 171, 192, 223, 224, 227
<i>P. ferruginosa</i> Syd.	146, 154, 167, 171, 182, 183, 192, 224, 228
<i>P. Funkiae</i> Diet.	140, 167, 170, 192, 224, 228
<i>P. Glechomatis</i>	182
<i>P. Gymnandrae</i> Tranzsch.	164, 167, 171, 193, 223, 224, 227

	Page
<i>P. hakkodensis</i> Hirats. f.	131, 151, 183
<i>P. Haleniae</i> Arth. et Holw.	146, 182
<i>P. Hieracii</i> (Schum.) Mart.	152, 154, 157, 167, 170, 193, 224, 229
<i>P. Horiana</i>	182
<i>P. Hostae</i> Hara	193
<i>P. Hultenii</i> Tranzsch. et Jorstad	131, 133, 167, 170, 194, 223, 224, 228
<i>P. iwateyamensis</i> Hirats. f.	140, 167, 170, 194, 223, 224, 228, 230
<i>P. Lactucae</i> Diet.	154, 157, 167, 170, 194, 224, 228
<i>P. Majanthemi</i> Diet. { 133, 141, 146, 148, 151, 154, 157, 167, 171, 181, 183, 195, 223, 225, 228	225, 228
<i>P. mamillata</i> (not Schröt.)	190
<i>P. melanoplaca</i> Syd. — 141, 146, 148, 151, 154, 157, 167, 171, 181, 182, 196, 223, 225, 228	223, 225, 227
<i>P. melasmoides</i> Tranzsch.	164, 167, 171, 196, 223, 225, 227
<i>P. Metanartheicii</i> Pat.	141, 167, 170, 196, 225, 228
<i>P. monticola</i> (not Kom.)	190
<i>P. Nanbuana</i> P. Henn.	133, 139, 167, 170, 197, 198, 225, 228
<i>P. nitidula</i> Tranzsch.	141, 167, 170, 198, 223, 225, 227
<i>P. pachycephala</i> Diet.	141, 167, 170, 198, 225, 228
<i>P. Patriniiae-gibbosae</i> Miura	196
<i>P. Picridis</i> Hazsl.	193
<i>P. Polygoni-Weyrichii</i> T. Miyake	154, 167, 170, 198, 223, 225, 228
<i>P. porphyrogenita</i> Curt. { 131, 133, 146, 148, 151, 154, 157, 167, 171, 181, 183, 199, 223, 225, 227	223, 225, 227
<i>P. Pulsatillae</i> Kalchbr.	146, 149, 167, 171, 181, 199, 223, 225, 227, 229
<i>P. rhytismoides</i> Johans.	164, 167, 171, 199, 223, 225, 227
<i>P. Ribis-japonici</i> P. Henn.	146, 149, 167, 171, 182, 199, 223, 225, 228
<i>P. Rumicis-scutati</i> (not Wint.)	133, 194
<i>P. Saxifragae</i> Schlecht. { 131, 134, 146, 149, 152, 155, 157, 167, 171, 182, 183, 200, 223, 225, 227, 229	225, 227, 229
<i>P. Schelliana</i> (not Thüm.)	202
<i>P. Schizocodonis</i> Pat. — 131, 146, 149, 152, 155, 157, 167, 171, 181, 200, 223, 225, 228	223, 225, 228
<i>P. Schizonepetae</i> Tranzsch.	141, 152, 183
<i>P. sibirica</i> Tranzsch.	141, 164, 167, 170, 201, 223, 225, 227
<i>P. Togashiana</i> Hirats. f.	141, 167, 171, 201, 223, 225, 228, 230
<i>P. Tokunagai</i> Ito et Kawai	164, 167, 171, 201, 223, 225, 228
<i>P. Trautvetteriae</i> Syd. et Holw. { 131, 134, 142, 152, 155, 157, 167, 171, 183, 201, 223, 225, 227	223, 225, 227
<i>P. uralensis</i> Tranzsch.	131
<i>P. Veratri</i> Duby	229
<i>P. Veronicarum</i> DC.	131, 134, 167, 171, 183, 201, 223, 225, 227, 229
<i>P. vesiculosa</i> Schlecht. { 131, 134, 146, 149, 152, 155, 157, 167, 171, 181, 183, 202, 223, 225, 227	223, 225, 227
<i>P. Violae</i> (Schum.) DC.	142, 146, 149, 155, 157, 167, 170, 202, 225, 229
<i>P. Violae-glabellae</i> Miura	131, 135, 142, 152, 155, 167, 170, 203, 223, 225, 228
<i>P. Virgaureae</i> Corda	203

	Page
<i>P. Virgaureae</i> (DC.) Lib.	143, 167, 171, 203, 225, 227, 229
<i>P. vomica</i> Thüm.	146, 149, 167, 171, 182, 204, 223, 225, 227
<i>P. Waldsteiniae</i> Curt.	131, 146, 182, 183
<i>P. Zopfii</i> Wint.	190
<i>Pucciniastrum Agrimoniae</i> (Diet.) Tranzsch.	139
<i>P. Circaeae</i> (Thüm.) Speg.	130
<i>P. Fagi</i> Yamada	139
<i>P. Goodyerae</i> Arth.	130
<i>P. Hydrangeae-petiolaridis</i> Hirats. f.	130
<i>P. Pyrolae</i> (Karst.) Schröt.	139, 144, 168, 171, 211, 226, 227, 229
<i>P. (Thekopsora) Filicum</i> Diet.	214
<i>Thekopsora areolata</i> (Fr.) P. Magn.	130
<i>Th. guttata</i> (Schröt.) Syd.	131
<i>Th. Myrtilliina</i> Karst. — 130, 136, 144, 146, 150, 158, 168, 171, 212, 223, 226, 227, 229	223, 226, 227, 229
<i>Th. sparsa</i> (Wint.) P. Magn.	130, 136, 158, 168, 171, 213, 223, 226, 227, 229
<i>Th. Tripetaleiae</i> Hirats. f.	130, 136, 139, 144, 158, 168, 171, 213, 226, 228
<i>Th. Vacciniorum</i> Karst. { 130, 136, 145, 146, 150, 152, 156, 158, 168, 171, 214, 226, 227, 229	227, 229
<i>Th. Vacciniorum</i> (not Karst.)	212
<i>Tranzschelia fusca</i> (Pers.) Diet.	146, 182
<i>Triphragmium Thwaitesii</i> Berk. et Br.	146, 182
<i>Uredinopsis filicina</i> (Niessl) P. Magn.	145, 168, 171, 215, 226, 227, 229
<i>Uredo Compositarum</i> (not Diet.)	221
<i>U. Hostae</i> P. Henn.	193
<i>U. Tripetaleiae</i> Diet.	213
<i>Uromyces Aconiti-Lycotoni</i> (DC.) Wint.	229
<i>U. acutatus</i> (not Fuck.)	163
<i>U. amoenus</i> Syd.	163, 166, 171, 184, 222, 224, 227
<i>U. Armeriae</i> (Schlecht.) Lév.	229
<i>U. Cacaliae</i> (DC.) Unger	130, 132, 166, 171, 183, 184, 222, 224, 227, 229
<i>U. Euphorbiae-corniculati</i> Jordi	229
<i>U. Geranii</i> (DC.) Fr.	163, 166, 170, 184, 223, 224, 227, 229
<i>U. Geranii</i> Otth et Wartm.	184
<i>U. Hedysari-obscuri</i> (DC.) Carest. et Picc. — 148, 163, 166, 170, 185, 223, 224, 227, 229	223, 224, 227, 229
<i>U. japonicus</i> Berk. et Curt.	152, 166, 170, 185, 224, 227, 229
<i>U. Komarovii</i> Bubák.	187
<i>U. Loti</i> Blytt.	229
<i>U. Miurae</i> Syd.	146, 147, 157, 158, 166, 171, 181, 186, 222, 224, 227
<i>U. Peracarpae</i> Ito et Tochinai	130, 163, 166, 171, 183, 186, 224, 228
<i>U. reticulatus</i> Bubák	185
<i>U. Rudbeckiae</i> Arth. et Plow. { 139, 146, 147, 151, 152, 157, 158, 166, 171, 182, 183, 186, 224, 227	186, 224, 227
<i>U. Rudbeckiae</i> forma <i>Virgaureae</i> P. Henn.	187
<i>U. sakavensis</i> P. Henn.	187

	Page
U. Solidaginis (Sommerf.) Niessl {	130, 132, 139, 146, 147, 151, 153, 157, 158, 166,
	171, 181, 183, 187, 222, 224, 227, 229
U. Veratri (DC.) Schröt.	140, 152, 153, 157, 158, 166, 170, 188, 224, 227, 229
U. yatsugatakense Hirats. f.	147, 153, 166, 170, 189, 222, 223, 224, 228, 230
Xenodochnus carbonarius Schlecht.	139, 143, 168, 170, 205, 226, 227, 229
X. minor Arth.	131, 135, 168, 171, 183, 206, 223, 226, 227

Host index

(Synonyms and species incidentally mentioned in *italic* type)

	Page
<i>Abies brachyphylla</i>	209
<i>A. firma</i>	209
<i>A. homolepis</i>	209
<i>A. Mariesii</i>	209
<i>A. Mayriana</i>	209
<i>A. sachalinensis</i>	209, 216
<i>A. Veitchii</i>	209
<i>Aletris foliata</i>	141, 197
<i>Allium Victorialis</i>	152, 186
<i>Alnus alnobetula</i> var. <i>fruticosa</i>	144, 210
<i>A. alnobetula</i> var. <i>sachalinensis</i>	210
<i>A. firma</i> var. <i>hirtella</i>	210
<i>A. firma</i> var. <i>multinervis</i>	210
<i>A. firma</i> var. <i>Sieboldiana</i>	210
<i>A. Maximowiczii</i>	144
<i>A. pendula</i>	210
<i>A. viridis</i> var. <i>sibirica</i>	144
<i>Anaphalis alpicola</i>	163, 184
<i>Anemone narcissiflora</i>	149, 155, 160, 202
<i>A. narcissiflora</i> var. <i>sachalinensis</i>	134, 202
<i>A. pitens</i> var. <i>intermedia</i>	149
<i>Angelica edulis</i>	139, 198
<i>A. inaequaltis</i>	198
<i>A. kiusiana</i>	198
<i>A. polyclada</i>	198
<i>A. shikokiana</i>	198
<i>A. ursina</i>	198
<i>A. Yoshinagae</i>	198
<i>Aquilegia akitensis</i>	164, 196
<i>Arctous japonicus</i>	136, 161, 213
<i>Artemisia desertorum</i>	192
<i>A. japonica</i>	192
<i>A. vulgaris</i> var. <i>coarctata</i>	192
<i>A. vulgaris</i> var. <i>indica</i>	192
<i>A. vulgaris</i> var. <i>integrifolia</i>	154, 192
<i>A. vulgaris</i> var. <i>kamtschatica</i>	192
<i>A. vulgaris</i> var. <i>latiloba</i>	192
<i>A. vulgaris</i> var. <i>vulgatissima</i>	192
<i>Athyrium Filix-foemina</i> var. <i>nigropaleaceum</i>	157, 162, 215
<i>A. iseanum</i>	215

	Page
<i>A. nipponicum</i>	215
<i>A. pterorachis</i>	215
<i>Bistorta vivipara</i>	153, 190
<i>B. vulgaris</i>	190
<i>B. vulgaris</i> var. <i>pacifica</i>	190
<i>Blechnum orientale</i>	215
<i>Cacalia adenostyloides</i>	151, 162, 219
<i>C. auriculata</i> var. <i>kamtschatica</i>	132, 184, 219
<i>C. auriculata</i> var. <i>ochotensis</i>	219
<i>C. delfinifolia</i>	219
<i>C. farfaraefolia</i> var. <i>farfaraefolia</i>	219
<i>C. hastata</i> var. <i>glabra</i>	129
<i>C. hastata</i> var. <i>pubescens</i>	219
<i>C. kamtschatica</i>	184
<i>C. Krameri</i>	219
<i>Caltha palustris</i> var. <i>sibirica</i> f. <i>decumbens</i>	190
<i>C. palustris</i> var. <i>typica</i>	132, 190
<i>Campanula lasiocarpa</i>	133, 140, 191
<i>Cerastium alpinum</i> var. <i>beeringianum</i>	209
<i>C. schizopetalum</i>	161, 209
<i>C. vulgatum</i> var. <i>glandulosum</i>	209
<i>Chamaepericlymenum canadense</i>	134, 148, 154, 160, 199
<i>Ch. suecicum</i>	199
<i>Chimaphila taiwaniana</i>	211
<i>Ch. umbellata</i>	211
<i>Circaea alpina</i>	133, 148, 153, 159, 191
<i>C. erubescens</i>	191
<i>Coelopleurum Gmelini</i>	198
<i>Convallaria majalis</i>	195
<i>Cornus canadensis</i>	134
<i>C. suecica</i>	199
<i>Cystopteris fragilis</i>	215
<i>Diplazium japonicum</i>	215
<i>D. squamigerum</i>	215
<i>D. Taequetii</i>	215
<i>D. Wichurae</i>	215
<i>Disporum smilacinum</i>	148, 154, 195
<i>Dryopteris africana</i>	215
<i>D. decursivo-pinnata</i>	215
<i>D. gracilescens</i> var. <i>glanduligerum</i>	215
<i>D. laxa</i>	215
<i>D. Phegopteris</i>	145, 215
<i>Elodes japonica</i>	207
<i>Empetrum nigrum</i>	137, 151, 156, 162, 217

	Page
<i>Epilobium Hornemanii</i>	133, 192
<i>Fauria Crista-Galli</i>	165, 220
<i>Fritillaria camschatensis</i>	145, 147, 158, 186
<i>Geranium erianthum</i>	163, 185
<i>G. shikokianum</i>	185
<i>G. sibiricum</i>	185
<i>G. Suzukii</i>	185
<i>G. yezoense</i> var. <i>nipponicum</i>	154, 191
<i>Geum pentapetalum</i>	135
<i>Hedysarum elongatum</i> var. <i>albiflorum</i>	148, 153, 189
<i>H. esculentum</i>	148
<i>H. obscurum</i> var. <i>neglectum</i>	163, 185
<i>Hieracium japonicum</i>	154, 159, 194
<i>H. umbellatum</i>	194
<i>Hosta japonica</i> & its var.	193
<i>H. minor</i>	193
<i>H. plantaginea</i>	193
<i>H. Sieboldiana</i> var. <i>longipes</i>	140, 141, 195
<i>H. Sieboldiana</i> & its var.	193
<i>Hypericum Ascyron</i>	207
<i>H. crassifolium</i>	207
<i>H. Gebleri</i>	207
<i>H. hakonense</i>	207
<i>H. kamtschaticum</i>	136, 156, 161, 207, 208
<i>H. Nagasawai</i>	207
<i>H. paramushirensis</i>	207
<i>H. senanense</i>	208
<i>H. taihezanense</i>	208
<i>H. virginicum</i> var. <i>japonicum</i>	207
<i>Izeris alpicola</i>	154
<i>Juniperus chinensis</i> var. <i>Sargentii</i>	143, 205
<i>J. Sargentii</i>	143
<i>Lactuca alpicola</i>	154, 159, 194
<i>L. dentata</i> var. <i>albiflora</i>	194
<i>L. dentata</i> var. <i>Thunbergiana</i>	195
<i>L. stolonifera</i>	195
<i>Lagotis glauca</i>	164
<i>Ledum palustre</i> var. <i>angustum</i>	218
<i>L. palustre</i> var. <i>dilatatum</i>	218
<i>L. palustre</i> var. <i>nipponicum</i>	145, 218
<i>L. palustre</i> var. <i>procumbens</i>	138, 218
<i>L. palustre</i> var. <i>yesoense</i>	137, 218
<i>Leontopodium japonicum</i> subsp. <i>sachalinense</i>	165
<i>L. sachalinense</i>	165, 201

	Page
<i>Ligularia calthaefolia</i>	220
<i>L. Hodgsoni</i>	220
<i>L. sibirica</i>	145, 220
<i>L. sibirica</i> var. <i>speciosa</i>	220
<i>L. stenocephala</i>	220
<i>L. stenocephala</i> var. <i>typica</i>	220
<i>L. tussilaginea</i> var. <i>formosana</i>	220
<i>Majanthemum dilatatum</i>	133, 141, 148, 154, 159, 195
<i>Matteuccia orientalis</i>	215
<i>Metanartheceum foliatum</i>	141
<i>M. luteo-viride</i>	197
<i>Oxalis Acetosella</i>	136, 144, 150, 156, 208
<i>O. Acetosella</i> var. <i>japonica</i>	280
<i>O. Griffithi</i>	208
<i>O. obtriangulata</i>	208
<i>Patrinia gibbosa</i>	141, 196
<i>P. triloba</i>	148, 154, 159, 196
<i>Pedicularis japonica</i>	219
<i>P. Oederi</i>	138, 219
<i>P. resupinata</i>	162
<i>P. yezoensis</i>	157, 219
<i>Peracarpa carnosus</i>	163, 186
<i>Peucedanum decursivum</i>	198
<i>P. multivittatum</i>	133, 159, 198
<i>Picea jezoensis</i>	217
<i>Picris hieracioides</i> var. <i>japonica</i>	194
<i>P. morrisonensis</i>	194
<i>Pinus pumila</i>	138, 218, 219, 221
<i>Pirola media</i>	211
<i>P. minor</i>	211
<i>P. renifolia</i>	211
<i>P. rotundifolia</i> var. <i>incarnata</i>	144, 211
<i>P. secunda</i> var. <i>vulgaris</i>	212
<i>Pleuropterypyrum ajanense</i> var. <i>glabrescens</i>	164, 201
<i>P. ajanense</i> var. <i>pilosum</i>	164, 201
<i>P. Nakaii</i>	140, 141, 194, 198
<i>P. Savatieri</i>	159, 190, 198
<i>P. Weyrichii</i>	190, 198
<i>P. Weyrichii</i> var. <i>alpicolum</i>	132, 153, 191, 198
<i>Polygonum Bistorta</i>	190
<i>P. pacificum</i>	190
<i>P. polymorphum</i> var. <i>ajanense</i> f. <i>glabrescens</i>	164
<i>P. polymorphum</i> var. <i>ajanense</i> f. <i>pilosum</i>	164
<i>P. Savatieri</i>	159

	Page
<i>P. viviparum</i>	153
<i>Potentilla chinensis</i>	205
<i>P. chinensis</i> var. <i>littoralis</i>	205
<i>P. Matsumurae</i>	135, 150, 156, 160, 165, 204, 205
<i>P. nipponica</i>	205
<i>Pulsatilla angustifolia</i> var. <i>japonica</i>	149
<i>P. nipponica</i>	149, 199
<i>Rhododendron chrysanthum</i>	137, 150, 216
<i>Rh. Degronianum</i>	217
<i>Rh. Fauriae</i>	151, 160, 217
<i>Rh. Fauriae</i> var. <i>roseum</i>	217
<i>Rh. Morii</i>	217
<i>Rh. nankotaisanense</i>	217
<i>Rh. pseudo-chrysanthum</i>	217
<i>Ribes japonicum</i>	149, 200
<i>Rosa acicularis</i> var. <i>Gmelini</i>	155, 204
<i>Rubus arcticus</i>	206
<i>R. pedatus</i>	135, 150, 156, 160, 204
<i>R. pseudo-japonicus</i>	165, 206
<i>Rumex Acetosa</i> var. <i>alpina</i>	194
<i>R. arifolius</i>	133, 194
<i>R. montanus</i>	133
<i>Sanguisorba albiflora</i>	143, 206
<i>S. grandiflora</i>	206
<i>S. hakusanensis</i>	206
<i>S. officinalis</i>	206
<i>S. sitchensis</i>	135, 206
<i>S. tenuifolia</i> var. <i>alba</i>	206
<i>S. tenuifolia</i> var. <i>grandiflora</i>	206
<i>Saussurea acuminata</i>	221
<i>S. gracilis</i>	221
<i>S. grandifolia</i>	221
<i>S. japonica</i>	221
<i>S. kai-montana</i> f. <i>major</i>	150, 204
<i>S. manshurica</i>	221
<i>S. Maximowiczii</i>	221
<i>S. nambuana</i>	221
<i>S. nupuripoensis</i>	221
<i>S. Riederi</i>	138, 221
<i>S. sachalinensis</i>	221
<i>S. sagittata</i>	145, 221
<i>S. Tanakae</i>	221
<i>S. Tanakae</i> var. <i>phyllolepis</i>	204
<i>S. Tilesii</i> var. <i>nivea</i>	138, 221

	Page
<i>S. Yoshinagai</i>	221
<i>S. sp.</i>	163, 222
<i>Saxifraga cortusaefolia</i> var. <i>typica</i>	160, 200
<i>S. fusca</i>	134, 149, 155, 160, 200
<i>S. punctata</i>	200
<i>Shortia soldanelloides</i> var. <i>genuina</i>	141, 149, 155, 160, 200
<i>Sh. uniflora</i>	200
<i>Sieversia pentapetala</i>	135, 156, 161, 205
<i>Smilacina davurica</i>	196
<i>S. japonica</i>	196
<i>Solidago hachijoensis</i>	187
<i>S. Virgaurea</i>	132, 139, 140, 143, 147, 152, 153, 158, 187, 188, 204
<i>S. sp.</i>	187
<i>Sorbus Aucuparia</i>	143
<i>Stellaria florida</i> var. <i>angustifolia</i>	161, 209
<i>S. longifolia</i>	210
<i>S. media</i>	210
<i>S. radians</i>	210
<i>S. yezoensis</i>	144, 210
<i>Thalictrum alpinum</i>	164, 199
<i>Th. tuberiferum</i>	142, 164, 199, 201
<i>Tiarella polyphylla</i>	140, 189
<i>Trautvetteria japonica</i>	134, 142, 155, 160, 201
<i>T. japonica</i> var. <i>borealis</i>	201
<i>T. palmata</i> var. <i>japonica</i>	134
<i>Trillium kamschaticum</i>	196
<i>T. Tschonoskii</i>	196
<i>Tripetaleia bracteata</i>	136, 144, 161, 213
<i>T. paniculata</i>	144, 213
<i>Vaccinium axillare</i>	136, 144, 150, 161, 212
<i>V. Chamissonis</i>	136, 212
<i>V. hirtum</i>	212
<i>V. Smallii</i>	136, 212
<i>V. uliginosum</i>	136, 161, 212
<i>V. Usunoki</i>	213
<i>V. Vitis-Idaea</i>	137, 144, 150, 156, 162, 214, 216
<i>Veratrum album</i> var. <i>grandiflorum</i>	153, 159, 188
<i>V. Maximowiczii</i>	141, 198
<i>V. nigrum</i> var. <i>japonicum</i>	198
<i>V. stamineum</i>	140, 189
<i>V. sp.</i>	189
<i>Veronica morrisonicola</i>	202
<i>V. sibirica</i>	202
<i>V. yezoensis</i>	134, 202

	Page
<i>V. virginica</i> var. <i>japonica</i>	202
<i>Viola acuminata</i>	203
<i>V. biflora</i>	142, 148, 149, 153, 155, 159, 160, 189, 203
<i>V. Boissieuana</i>	203
<i>V. brevistipulata</i>	142, 155, 203
<i>V. collina</i>	203
<i>V. crassa</i>	135, 143, 203
<i>V. glabella</i>	203
<i>V. grypoceras</i>	203
<i>V. Langsdorfii</i>	203
<i>V. mandshurica</i> var. <i>glabra</i>	203
<i>V. nipponica</i>	203
<i>V. oblongo-sagittata</i>	203
<i>V. ovato-oblonga</i>	203
<i>V. Patrini</i> var. <i>typica</i>	203
<i>V. rupicola</i>	203
<i>V. Selkirkii</i>	164, 203
<i>V. sylvestriformis</i>	203
<i>V. tozanensis</i>	203
<i>V. vaginata</i>	153, 189
<i>Xolisma elliptica</i>	213

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UREDINALES OF SHIKOKU ⁽¹⁾

[Contributions to the rust-flora of Eastern Asia~II]

By

Naohide HIRATSUKA and Torama YOSHINAGA

With 4 text-figures

CONTENTS

	Page
Introduction	251
Enumeration of species	254
Melampsoraceae	254
<i>Uredinopsis</i> Magnus	254
<i>Milesina</i> Magnus	255
<i>Hyalopsora</i> Magnus	257
<i>Melampsoridium</i> Klebahn	258
<i>Melampsorella</i> Schröter	259
<i>Pucciniastrum</i> Otth	259
<i>Thekopsora</i> Magnus	262
<i>Melampsora</i> Castagne	263
<i>Chnoospora</i> Dietel	264
<i>Phakopsora</i> Dietel	265
<i>Chrysomyxa</i> Unger	267
<i>Cronartium</i> Fries	267
<i>Coleopuccinia</i> Patouillard	267
<i>Coleosporium</i> Léveillé	268
Pucciniaceae	274
<i>Hemileia</i> Berkeley et Broome	274
<i>Tranzschelia</i> Arthur	274
<i>Blastospora</i> Dietel	275
<i>Mainsia</i> Jackson	275
<i>Kuehneola</i> Magnus	275
<i>Hamaspora</i> Körnicke	276
<i>Phragmidium</i> Link	276
<i>Triphragmium</i> Link	279
<i>Pileolaria</i> Castagne	280
<i>Ravenelia</i> Berkeley	281
<i>Nothoravenelia</i> Dietel	281

⁽¹⁾The present work has been partially aided by a grant to the senior author from the Foundation for the Promotion of Scientific and Industrial Research of Japan.

	Page
<i>Gymnosporangium</i> Hedwig, f.	281
<i>Stereostratum</i> Magnus	282
<i>Pucciniostele</i> Tranzschel et Komarov	283
<i>Ochropsora</i> Dietel	283
<i>Xenostele</i> Sydow	284
<i>Miyagia</i> Miyabe	285
<i>Rostrupia</i> Lagerheim	285
<i>Uromyces</i> Link	285
<i>Puccinia</i> Persoon	296
Uredinales imperfecti	325
<i>Aecidium</i> Persoon	325
<i>Caecoma</i> Link	333
<i>Uredo</i> Persoon	333
Doubtful species	336
Excluded species	336
Microcyclic species of rust fungi found in Shikoku	337
Geographical distribution of species of rust fungi found in Shikoku	338
Fungus index	350
Host index	363
Bibliography on Uredinales of Shikoku	375

INTRODUCTION

The first record of rust fungi from Shikoku was made by Paul Christoph Hennings. In 1900, he (11) described the two new species of *Aecidium*; *Aecidium Akebiae* Hennings on *Akebia quinata* Decne. and *Aecidium Lophanthi* Hennings (*Ae. Plectranthi* Barcl.) on *Plectranthus japonicus* Koidz. (sub "*Lophanthus* sp."), based upon specimens which were collected by the junior author from the province of Tosa. Since that time, a large number of reports concerning the rust fungi occurring in this district have been published by Hennings, P. Dietel, P. & H. Sydow, S. Itô, S. Kusano, the authors and others, mainly based upon collections made by the junior author in Tosa Province. In these publications, more than two hundred fifty species including two new genera and seventy-three new species were reported.

The materials used by the authors in the present work include besides a large number of collections made by the junior author from different places of this district, the specimens collected by K. Kimura, K. Okudaira, M. Kamimura, T. Morimoto, A. Ôyama and others. The total number of specimens examined amounts to more than two thousand, in which 294 species and form-species are included. The following table shows the number of species, by genera, heretofore known from Shikoku, additions in the present paper and the total.

TABLE 1

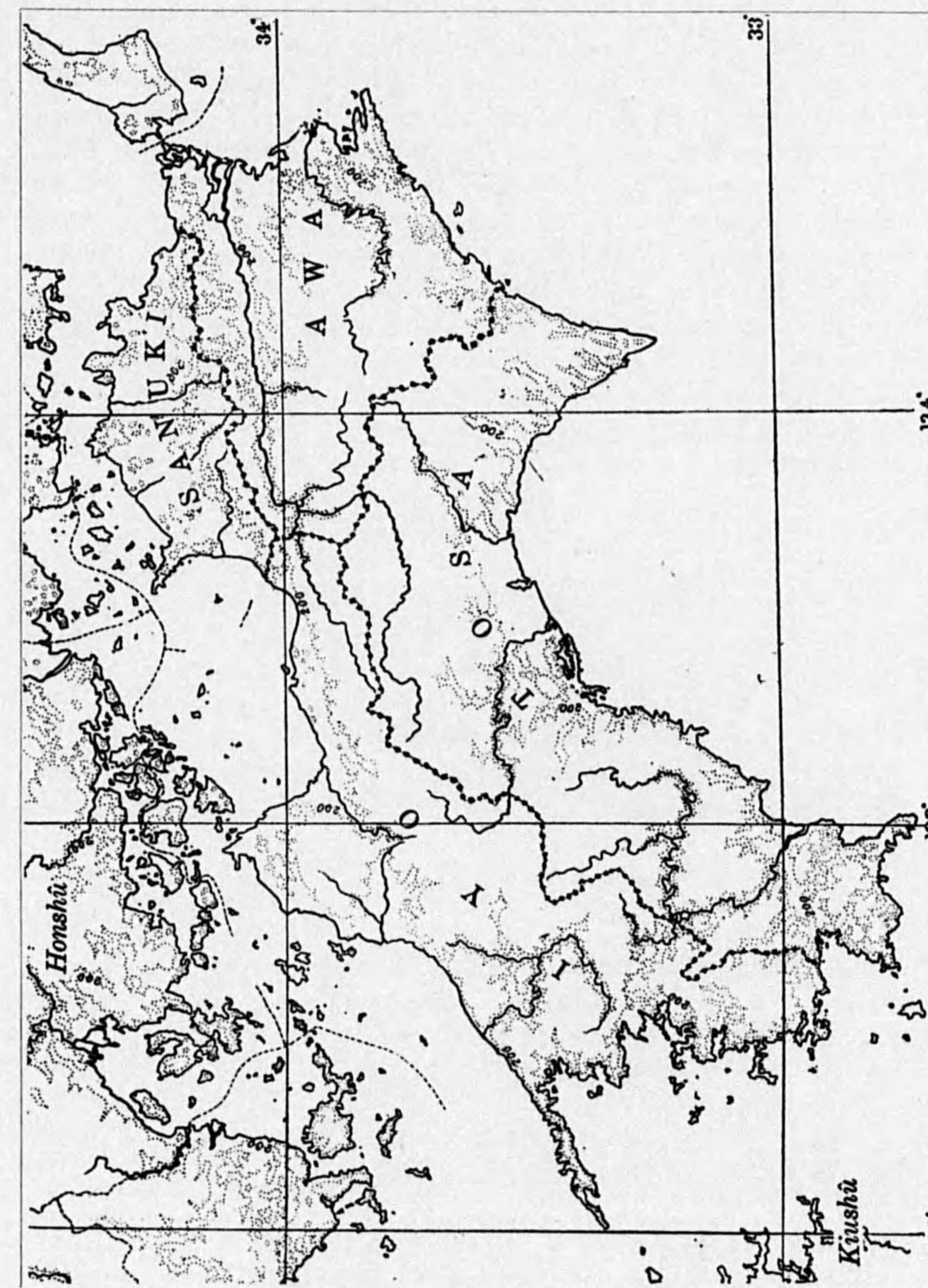
Number of species of rust fungi found in Shikoku

Families	Genera	Number of species		
		Previously reported	Present additions	Total
Melampsoraceae	<i>Uredinopsis</i>	2	1	3
	<i>Milesina</i>	4	5	9
	<i>Hyalopsora</i>	1	1	2
	<i>Melampsoridium</i>	2	2	4
	<i>Melampsorella</i>	1	—	1
	<i>Pucciniastrum</i>	10	1	11
	<i>Thekopsora</i>	2	—	2
	<i>Melampsora</i>	7	—	7
	<i>Chnoopsora</i>	1	—	1
	<i>Phakopsora</i>	6	—	6
	<i>Chrysomyxa</i>	1	—	1
	<i>Cronartium</i>	—	1	1
	<i>Coleopuccinia</i>	1	—	1
	<i>Coleosporium</i>	20	2	22

TABLE 1 (Continued)

Families	Genera	Number of species		
		Previously reported	Present additions	Total
Pucciniaceae	Hemileia	1	—	1
	Tranzschelia	1	1	2
	Blastospora	1	—	1
	Mainsia	1	—	1
	Kuehneola	1	—	1
	Hamaspora	1	—	1
	Phragmidium	6	—	6
	Triphragmium	2	—	2
	Pileolaria	3	—	3
	Ravenelia	1	—	1
	Nothoravenelia	1	—	1
	Gymnosporangium	2	1	3
	Stereostratum	1	—	1
	Pucciniosteles	1	—	1
	Ochropsora	2	—	2
	Xenosteles	2	—	2
	Miyagia	—	1	1
	Rostrupia	1	—	1
	Uromyces	33	2	35
	Puccinia	94	14	108
Uredinales imperfecti	Accidium	33	5	38
	Caeoma	1	1	2
	Uredo	5	4	9
Total number		252	42	294

As shown in the above table, the rust-flora of Shikoku is made up of 37 genera and 294 species, including 49 species of the three form-genera, *Accidium*, *Caeoma* and *Uredo*. Among all the genera, the largest is the *Puccinia* having 108 species; next comes the *Accidium*, then the *Uromyces*, the *Coleosporium* and the *Pucciniustrum*, each having more than 10 species. Among the 294 species, the following seven are ascertained to be new to science:- *Milesina pteridicola* Hiratsuka, f. on *Pteris quadriaurita* Retz, *Puccinia Kimurai* Hiratsuka, f. et Yoshinaga on *Pollinia Willdenowiana* Benth., *Puccinia Caricis-*



Text-fig. 1. A map of Shikoku, showing the provinces

scabrifoliae Hiratsuka, f. et Yoshinaga on *Carex scabrifolia* Steud. and *C. brunnea* Thunb., *Puccinia Okudairai* Hiratsuka, f. et Yoshinaga on *Scilla japonica* Bak., *Aecidium Alangii* Hiratsuka, f. et Yoshinaga on *Alangium platanifolium* Harm. var. *macrophyllum* Wang., *Uredo Geranii-nepalensis* Hiratsuka, f. et Yoshinaga on *Geranium nepalense* Sweet and *Uredo iyoensis* Hiratsuka, f. et Yoshinaga on *Viola Boisseuana* Mak. and *V. shikokiana* Mak. And the following three species are treated as new combinations:- *Milesina erythrosora* (Faull) Hiratsuka, f., *Pucciniastrum Stachyuri* (Diet.) Hiratsuka, f. et Yoshinaga and *Xenostele Nakanoi* (Kusano et Yoshinaga) Hiratsuka, f. et Yoshinaga.

The authors wish to express their heartiest thanks to Professor Seiya Itô, Hokkaidô Imperial University for his kind help and valuable advice, and they are also under obligation to Messrs. K. Kimura, M. Kamimura, A. Oyama, T. Morimoto and others for their kindness in sending them many valuable specimens.

ENUMERATION OF SPECIES

Melampsoraceae

Uredinopsis Magnus, 1893.

1. **Uredinopsis Adianti** Komarov in Jaczewski, Komarov & Tranzschel, Fung. Ross. exs. no. 278, 1899. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 472, 1934).

Hab. On *Adiantum pedatum* L. (*Kujaku-shida*). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga)⁽¹⁾.

2. **Uredinopsis filicina** (Niessl) Magnus in Atti Congr. Bot. Internat. Genova (1892), p. 167, 1893. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 473, 1934; Mem. Tottori Agric. Coll. III, p. 215, 1935).

Syn. *Protomyces? filicinus* Niessl in Rabenh., Fung. eur. no. 1659, 1873.

Hab. On *Dryopteris Phegopteris* C. Chr. (*Miyama-warabi*). Prov. Iyo:- Omogôsan (Omogô-mura) (T. Yoshinaga).

⁽¹⁾ The data represented by the list is based almost wholly upon specimens in the herbarium of the senior author. The name of the collector of each specimen cited is given in parentheses.

3. **Uredinopsis Pteridis** Dietel et Holway in Dietel in Ber. Deutsch. Bot. Ges. XIII, p. 331 & pl. XXVI, figs. 10 & 11, 1895.

Hab. On *Pteridium aquilinum* Kühn var. *japonicum* Nakai (*Warabi*). Prov. Tosa:- Yasuda-machi (T. Yoshinaga); Mt. Yokogura (T. Yoshinaga).

Milesina Magnus, 1909.

4. **Milesina Coniogrammes** Hiratsuka, f. in Bot. Mag. Tokyo, XLVIII, p. 45 & text-fig. 6, 1934. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 471, 1934).

Hab. On *Coniogramme japonica* Diels (*Iwaganesô*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

On *Pteris cretica* L. (*Oba-inomosô*). Prov. Tosa:- Tsudai-mura (T. Yoshinaga). *Pteris cretica* L. is a new addition to the host plants of the present fungus.

5. **Milesina Cryptogrammes** (Dietel) Hiratsuka, f. in Jour. Jap. Bot. XI, p. 42, 1935.

Syn. *Hyalopsora Cryptogrammes* Dietel in Ann. Myc. VII, p. 356, 1909. (Dietel in Ann. Myc. VIII, p. 313, 1910; Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 21, 1932; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

Hab. On *Onychium japonicum* Kuntze (*Cryptogramme japonica* Prantl) (*Tachi-shinobu*). Prov. Tosa:- Kagami-mura (T. Yoshinaga, type!). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa); Furumiya-mura (T. Yoshinaga).

6. **Milesina Diplazii** Hiratsuka, f. in Bot. Mag. Tokyo, XLVIII, p. 44 & text-fig. 5, 1934.

Hab. On *Diplazium squamigerum* Christ. (*Kiyotaki-shida*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga).

7. **Milesina erythrosora** (Faull) Hiratsuka, f., nov. comb.

Syn. *Milesia carpatica* var. *erythrosora* Faull in Contrib. Arnold Arboretum, Harvard Univ. II, p. 57, 1932.

Hab. On *Dryopteris erythrosora* Kuntze (*Beni-shida*). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa).

On *Dryopteris lacera* Kuntze (*Kuma-warabi*). Prov. Tosa:- Shôwamura (T. Yoshinaga).

In 1932, Faull treated this species on *Dryopteris erythrosora* Kun-

tze which was collected by the senior author at Tottori, Inaba Province on May 21, 1930 as a variety of *Milesia carpatica* (Wróbl.) Faull, naming it *Milesia carpatica* var. *erythrosora*. Although the present fungus is closely related to *Milesina carpatica* Wróbl. (*Milesia carpatica* Faull), the senior author thinks it better to elevate this variety to a distinct specific rank on account of the larger size of the uredospores.

This species is widely distributed in southern districts of our country on the following four species of *Dryopteris*; such as, *Dryopteris erythrosora* Kuntze (Honshū, Shikoku and Kiushū), *D. pseudoerythrosora* Kodama (*Saigoku-benishida*) (Honshū), *D. lacera* Kuntze (Honshū, Shikoku and Kiushū) and *D. quadripinnata* Hayata (*Kenarai-shida*) (*Formosa*).

8. *Milesina exigua* Faull in Jour. Arnold Arboretum, XII, p. 219, 1931.

Hab. On *Microlepia strigosa* Presl (*Ishikaguma*). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa).

9. *Milesina Fauliana* Hiratsuka, f. et Uemura in Hiratsuka, f. in Bot. Mag. Tokyo, XLVIII, p. 41 & text-figs. 3 & 4, 1934.

Hab. On *Polystichum Fortunei* Nakai (*Yabusotetsu*). Prov. Tosa:- Befu-mura (A. Akisawa).

10. *Milesina microspora* Hiratsuka, f. in Bot. Mag. Tokyo, XLVIII, p. 43, 1934.

Hab. On *Dryopteris africana* C. Chr. (*Mizo-shida*). Prov. Tosa:- Tsudai-mura (T. Yoshinaga). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa).

11. *Milesina pteridicola* Hiratsuka, f., nov. spec.

Syn. *Hyalopsora filicum* (not Dietel) (Dietel in Ann. Myc. VIII, p. 313, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930, p. p.).

Hyalopsora Polypodii (not Magnus) (Hiratsuka, f. in Jour. Jap. Bot. XI, p. 42, 1935; Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 17, 1932, p. p.).

Soris uredosporiferis hypophyllis, subepidermalibus, sparsis vel laxe aggregatis, in areis discoloribus flavo-brunneolis insidentibus, rotundatis, ellipsoideis vel oblongis, minutis, 0.15~0.4 mm diam., epidermide tectis, flavo-brunneis; peridiis applanato-conoideis, cellulis peridiis irregulariter polygonalibus, minutis, subhyalinis, 8~15 μ

diam.; uredosporis subglobosis, obovatis, oblongis vel rarius oblongo-clavatis, 18~33 \times 10~18 μ , episporio tenui, 1 μ vel minus crasso, minutissime echinato, hyalino.

Teleutosporis in hypophyllo intra cellulas epidermidis evolutis, verticaliter septatis, 4~pluri-cellularibus, 10~20 \times 8~17 μ , parietibus tenuibus, levibus, hyalinis.

Hab. On *Pteris quadriaurita* Retz (*Pteris semipinnata* L. var. *dispar* Mak. (*Amakusa-shida*)). Prov. Tosa:- Takaoka-machi (Nov. 29, 1908, T. Yoshinaga).

The above specimen bears the uredospores only. But the senior author examined a specimen of its teleutostage on the same plant which was collected by K. Ide at Murasakibaru near Kogashi, Satsuma Province (*Kiushū*). The description of the teleutostage as mentioned above is based upon this specimen.

The present fungus resembles *Milesina Dryopteridis* Kamei, from which it differs by much larger uredosori, larger uredospores and others.

12. *Milesina vogesiaca* Sydow in Ann. Myc. VIII, p. 491, 1910. (Hiratsuka, f. & Yoshida in Transact. Tottori Soc. Agric. Sci. IV, p. 10, 1932).

Hab. On *Polystichum varium* Presl (*Itachi-shida*). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa).

Hyalopsora Magnus, 1901.

13. *Hyalopsora Polypodii* (Diet.) Magnus in Ber. Deutsch. Bot. Ges. XIX, p. 582, 1901. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 214, 1935; Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 15, 1932).

Syn. *Pucciniastrum Polypodii* Dietel in Hedwigia XXXVIII, p. (260), 1899.

Pucciniastrum (Thekopsora) Filicum Dietel in Engl. Bot. Jahrb. XXVII, p. 567 & pl. VII, fig. 6, 1899. (Dietel in Engl. Bot. Jahrb. XXXIV, p. 588, 1905; Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904).

Hyalopsora Filicum Dietel in Engl. Bot. Jahrb. XXXVII, p. 105, 1905. (Dietel in Ann. Myc. VIII, p. 313, 1910, p. p.; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

Hyalopsora Asplenii-Wichuriae Dietel in Ann. Myc. VI, p. 228, 1908.

(Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

Hab. On *Diplazium Taquetii* C. Chr. (*Shiroyama-shida*). Prov. Tosa:- Usa-machi (T. Yoshinaga).

On *Diplazium Wichurae* Diels. (*Nokogiri-shida*). Prov. Tosa:- Iokimura (T. Yoshinaga, type of *Hyalopsora Asplenii-Wichuriae* Dietel!).

On *Dryopteris decursivo-pinnata* Kuntze (*Gejigeji-shida*). Prov. Tosa:- Kagami-mura (T. Yoshinaga); Kamoda-mura (T. Yoshinaga). Prov. Iyo:- Iradzu-yama (T. Yoshinaga). Prov. Awa:- Naka-Kitô-mura (T. Yoshinaga).

On *Dryopteris laxa* C. Chr. (*Yawara-shida*). Prov. Tosa:- Kôchishi (T. Yoshinaga); Ushioe-yama (T. Yoshinaga).

14. **Hyalopsora aculeata** Kamei in Transact. Sapporo Nat. Hist. Soc. XII, p. 127 & text-figs. 1~2, 1932; Hiratsuka, f. & Uemura in Transact. Tottori Soc. Agric. Sci. IV, p. 22 & 25, 1932.

Hab. On *Blechnum Spicant* Wither. var. *nipponicum* Miyabe et Kudo (*Blechnum nipponicum* Makino) (*Shishi-gashira*). Prov. Tosa:- Asakura-mura (T. Yoshinaga). Prov. Awa:- Tokushima (Hiratsuka & S. Nakagawa).

Melampsoridium Klebahn, 1899.

15. **Melampsoridium betulinum** (Desm.) Klebahn in Zeitschr. f. Pflanzenkr. IX, p. 22 & text-fig. 1 (p. 19), 1899.

Syn. *Melampsora betulina* Desmazières, Pl. Crypt. no. 2047, 1850.

Hab. On *Betula shikokiana* Nakai (*Shikoku-dake-kamba*). Prov. Tosa:- Heike-daira (Tosa-Iyo-kokkyô) (T. Yoshinaga).

16. **Melampsoridium Carpini** (Fuck.) Dietel in Engler-Prantl, Natürl. Pflanzenfam. I, 1. Abt. **, p. 551, 1900. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930).

Syn. *Melampsora Carpini* Fuckel, Symb. Myc. p. 44, 1869.

Melampsoridium Carpini Klebahn (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (32), 1904).

Hab. On *Carpinus yedoensis* Maxim. (*Inu-shide*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga). Prov. Awa:- Mt. Kôtsu (T. Yoshinaga).

17. **Melampsoridium Alni** (Thüm.) Dietel in Engler-Prantl, Natürl. Pflanzenfam. I, 1. Abt. **, p. 551, 1900. (Hiratsuka, f.

[Memoirs Tottori Agric. College

in Mem. Tottori Agric. Coll. III, p. 209, 1935).

Syn. *Melampsora Alni* Thümen in Bull. Soc. Imper. Nat. Moscou, LIII, p. 226, 1878.

Hab. On *Alnus firma* Sieb. et Zucc. var. *hirtella* Franch. et Sav. (*Ôba-minebari*). Prov. Iyo:- Higashi-Sambô-ga-mori (Kiji-oku) (T. Yoshinaga).

On *Alnus firma* Sieb. et Zucc. var. *Sieboldiana* Winkl. (*Yashabushi*). Prov. Awa:- Mt. Tsurugi (T. Yoshinaga).

18. **Melampsoridium Hiratsukanum** Itô in Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 9, 1927. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930).

Syn. *Melampsora Alni* (not Thüm.) (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (32), 1905).

Melampsoridium Alni (not Dietel) (Dietel in Engl. Bot. Jahrb. XXXIV, p. 587, 1905).

Hab. On *Alnus hirsuta* Turcz. (*Ke-yamahannoki*). Prov. Tosa:- Hayayama-mura (T. Yoshinaga). Prov. Iyo:- Ochiai-yama (T. Yoshinaga).

On *Alnus hirsuta* Turcz. var. *sibirica* C. K. Schn. (*Yama-hannoki*). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

Melampsorella Schröter, 1874.

19. **Melampsorella Caryophyllacearum** Schröter in Hedwigia XIII, p. 85, 1874. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 208, 1935; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (32), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930).

Hab. On *Abies firma* Sieb. et Zucc. (*Momi*). Prov. Tosa:- Asakura-mura (T. Yoshinaga).

Pucciniastrum Otth, 1861.

20. **Pucciniastrum Agrimoniae** (Dietel) Tranzschel in Script. Bot. Hort. Univ. Petropol. IV, p. 301, 1895. (Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 273, 1930; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 654, 1930).

Syn. *Thekopsora Agrimoniae* Dietel in Hedwigia XXIX, p. 152, 1890.

Pucciniastrum Agrimoniae Dietel in Hedwigia XXXVI, p. 33, 1897. (Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904).

Vol. III, No. 2, 1935]

Hab. On *Agrimonia pilosa* Ledeb. (*Kin-midzuhiki*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Kamihayama-mura (A. Ôyama). Prov. Iyo:- Iradzu-yama (T. Yoshinaga). Prov. Awa:- Koyadaira-mura (T. Yoshinaga).

21. **Pucciniastrum Potentillae** Komarov in Jaczewski, Komarov & Tranzschel, *Fung. Ross. exs. no. 327*, 1899. (Dietel in *Ann. Myc.* VI, p. 227, 1908; *Engl. Bot. Jahrb.* XXXVII, p. 105, 1905; Hiratsuka, f. in *Jour. Facul. Agric. Hokkaidô Imp. Univ.* XXI, p. 92, 1927; *Bot. Mag. Tokyo*, XLIV, p. 275, 1930; Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 654, 1930).

Syn. *Phragmidium Fragariastrum* (not Schröter) (Hennings in *Engl. Bot. Jahrb.* XXXI, p. 732, 1902).

Hab. On *Potentilla fragarioides* L. (*Kijimushiro*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Mikadzuki-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

On *Potentilla Freyniana* Borum. (*Mitsuba-tsuchiguri*). Prov. Tosa:- Aki-machi (T. Yoshinaga).

22. **Pucciniastrum Boehmeriae** Sydow in *Ann. Myc.* I, p. 19, 1903. (Dietel in *Engl. Bot. Jahrb.* XXXVII, p. 105, 1905; Hennings in *Engl. Bot. Jahrb.* XXXIV, p. 597, 1905; Hiratsuka, f. in *Jour. Facul. Agric. Hokkaidô Imp. Univ.* XXI, p. 94, 1927; *Bot. Mag. Tokyo*, XLIV, p. 278, 1930; Yoshinaga in *Bot. Mag. Tokyo*, XVIII, p. (34), 1904; Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 654, 1930).

Syn. *Uredo Boehmeriae* Dietel in *Engl. Bot. Jahrb.* XXVIII, p. 290, 1900.

Hab. On *Boehmeria holosericea* Bl. (*Oni-yabumao*). Prov. Tosa:- Higashikawa-mura (T. Yoshinaga).

On *Boehmeria Sieboldiana* Bl. (*Nagaba-yabumao*). Prov. Tosa:- Kitagawa-mura (T. Yoshinaga); Mt. Yanaze (T. Yoshinaga).

On *Boehmeria spicata* Thunb. (*Ko-akaso*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Ioki-mura (T. Yoshinaga).

On *Boehmeria tricuspis* Mak. (*Boehmeria platanifolia* Franch. et Sav. var. *tricuspis* Matsum.) (*Akaso*). Prov. Tosa:- Amatsubo-mura (T. Yoshinaga). Prov. Iyo:- Mikame-machi (K. Kimura).

23. **Pucciniastrum Castaneae** Dietel in *Hedwigia* XLI, p. (178), 1902. (Hennings in *Engl. Bot. Jahrb.* XXXIV, p. 597, 1905;

Hiratsuka, f. in *Jour. Facul. Agric. Hokkaidô Imp. Univ.* XXI, p. 96, 1927; *Bot. Mag. Tokyo*, XLIV, p. 279, 1930; Yoshinaga in *Bot. Mag. Tokyo*, XIX, p. (34), 1905; Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 654, 1930).

Hab. On *Castanea crenata* Sieb. et Zucc. (*Kuri*). Prov. Tosa:- Hatayama-mura (T. Yoshinaga); Ônomi-mura (A. Ôyama); Aki-machi (T. Yoshinaga). Prov. Iyo:- Shinritsu-mura (T. Nishida).

24. **Pucciniastrum Circaeae** (Thüm.) Spegazzini, *Dec. Myc. Ital.* no. 65, 1879. (Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 268, 1930; Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 654, 1930).

Syn. *Melampsora Circaeae* Thümen, *Myc. univ.* no. 447, 1876.

Hab. On *Circaea erubescens* Franch. et Sav. (*Tanitate*). Prov. Tosa:- Mt. Tsuetate (T. Yoshinaga); Mt. Yanaze (T. Yoshinaga).

On *Circaea quadrisulcata* Franch. et Sav. (*Midzutamasô*). Prov. Tosa:- Tosayama-mura (T. Yoshinaga). *Circaea quadrisulcata* Franch. et Sav. is a new addition to the host plants of the present fungus.

25. **Pucciniastrum Corni** Dietel in *Engl. Bot. Jahrb.* XXXIV, p. 587, 1905. (Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 653, 1930).

Hab. On *Cornus Kousa* Bueg. (*Benthamia japonica* Sieb. et Zucc.) (*Yamabôshi*). Prov. Tosa:- Mt. Kunimi (Amatsubo-mura) (T. Yoshinaga). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

26. **Pucciniastrum Kusanoi** Dietel in *Engl. Bot. Jahrb.* XXXII, p. 629, 1903. (Yoshinaga & Hiratsuka, f. in *Bot. Mag. Tokyo*, XLIV, p. 653, 1930).

Hab. On *Clethra barbinervis* Sieb. et Zucc. (*Ryôbu*). Prov. Tosa:- Mt. Kunimi (Amatsubo-mura) (T. Yoshinaga). Prov. Iyo:- Higashi-Sambô-ga-mori (Nibukawa-mura) (T. Yoshinaga). Prov. Awa:- Furumiya-mura (T. Yoshinaga).

27. **Pucciniastrum Hydrangeae-petiolaridis** Hiratsuka, f. in *Jour. Facul. Agric. Hokkaidô Imp. Univ.* XXI, p. 27, 1927.

Hab. On *Hydrangea petiolaris* Sieb. et Zucc. (*Hydrangea scandens* Maxim.) (*Tsuru-ajisai*). Prov. Tosa:- Mt. Inamura (Jizôji-mura) (T. Yoshinaga).

28. **Pucciniastrum Styracinum** Hiratsuka in *Bot. Mag. Tokyo*, XII, p. 32 & pl. II, figs. 7-13, 1898. (Hiratsuka, f. in *Jour. Jap.*

Bot. X, p. 470, 1934).

Hab. On *Pterostyrax micranthum* Sieb. et Zucc. (*Oba-asagara*). Prov. Tosa:- Hongawa-mura (T. Yoshinaga); Mt. Shiraga (T. Yoshinaga).

29. **Pucciniastrum Yoshinagai** Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 247 & text-fig. 1, 1931.

Hab. On *Stewartia pseudo-camellia* Maxim. (*Natsutsubaki*). Prov. Iyo:- Higashi-Sambô-ga-mori (Nibukawa-mura) (T. Yoshinaga, *type!*). Prov. Tosa:- Mt. Inamura (T. Yoshinaga).

30. **Pucciniastrum Stachyuri** (Diet.) Hiratsuka, f. et Yoshinaga, nov. comb.

Syn. *Uredo Stachyuri* Dietel in Engl. Bot. Jahrb. XXXVII, p. 108, 1905. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 622, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 665, 1930).

Hab. On *Stachyurus praecox* Sieb. et Zucc. (*Kibushi*). Prov. Tosa:- Mt. Yanaze (T. Yoshinaga, *type of Uredo Stachyuri* Diet.!).

Although the writers have not yet found its teleutostage, they think it better to treat this fungus as a species of *Pucciniastrum* on account of the essential characters of the uredostage.

Thekopsora Magnus, 1875.

31. **Thekopsora Myrtilina** Karsten, Myc. Fenn. IV, p. 59, 1879. (Hiratsuka, f. in Jour. Facul. Agric. Hokkaidô Imp. Univ. XXI, p. 19, 1927; Bot. Mag. Tokyo, XLIII, p. 16, 1929; Mem. Tottori Agric. Coll. III, p. 212, 1935; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

Syn. *Thekopsora Vacciniorum* (not Karsten) (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (34), 1905).

Hab. On *Vaccinium hirtum* Thunb. (*Sunoki*). Prov. Tosa:- Mt. Eboshi-washio (T. Yoshinaga); Asakura-mura (T. Yoshinaga); Kamoda-mura (T. Yoshinaga).

32. **Thekopsora Rubiae** Komarov in Jaczewski, Komarov & Tranzschel, Fung. Ross. exs. no. 328, 1899. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 654, 1930).

Hab. On *Rubia cordifolia* L. var. *lancifolia* Regel (*Kurumaba-akane*). Prov. Sanuki: Kusakabe-machi (T. Yoshinaga).

On *Rubia cordifolia* L. var. *Mungista* Miq. (*Akane*). Prov. Tosa:-

Agekura-mura (T. Yoshinaga).

Melampsora Castagne, 1843.

33. **Melampsora coleosporioides** Dietel in Engl. Bot. Jahrb. XXXII, p. 50, 1902. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905; Ann. Myc. VI, p. 227, 1908; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Hab. On *Salix babylonica* L. (*Shidare-yanagi*). Prov. Tosa:- Aki-machi (T. Yoshinaga).

On *Salix glandulosa* v. Seem. (*Akame-yanagi*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

34. **Melampsora humilis** Dietel in Engl. Bot. Jahrb. XXXII, p. 50, 1902.

Syn. *Melampsora epitea* (not Thümen) (Dietel in Ann. Myc. VIII, p. 313, 1910).

Melampsora Ribesii-purpureae (not Klebahn) (Dietel in Engl. Bot. Jahrb. XXXIV, p. 587, 1905).

Hab. On *Salix purpurea* L. (sub *Salix rubra* L. by Dietel) (*Hosobakori-yanagi*) (*Cult.*). Prov. Tosa:- Enokuchi-machi (T. Yoshinaga).

35. **Melampsora Larici-epitea** Klebahn in Zeitschr. f. Pflanzenkr. IX, p. 88, 1899.

Hab. On *Salix sachalinensis* Fr. Schm. (*Salix opaca* Anders.) (*O-noe-yanagi*, *Nagaba-yanagi*). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

36. **Melampsora Euphorbiae-dulcis** Otth in Berner Mitteil. (1868), p. 70, 1868. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Syn. *Melampsora Helioscopiae* (not Winter) (Dietel in Ann. Myc. VI, d. 227, 1908).

Hab. On *Euphorbia pekinensis* Rupr. (*Taka-tôdai*). Prov. Tosa:- Ikku-mura (T. Yoshinaga); Okô-yama (T. Yoshinaga).

On *Euphorbia Sieboldiana* Morr. et Decne. (*Natsu-tôdai*). Prov. Tosa:- Mikadzuki-mura (T. Yoshinaga).

37. **Melampsora Hypericorum** Schröter in Abhandl. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLVIII (1869~72), p. 26, 1870. (Hennings in Hedwigia XL, p. (125), 1901; Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (3),

1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Hab. On *Hypericum erectum* Thunb. (*Otogirisô*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

On *Hypericum hakonense* Franch. et Sav. (*Ko-otogiri*). Prov. Iyo:- Omogôsan (T. Yoshinaga); Nibukawa-mura (T. Yoshinaga); Oda-miyama (T. Yoshinaga).

On *Hypericum tosaense* Mak. (*Tosa-otogiri*). Prov. Tosa:- Osaka-tôge (T. Yoshinaga).

38. **Melampsora Idesiae** Miyabe in Hiratsuka in Bot. Mag. Tokyo, XI, p. 45 & pl. IV, figs. 1~3, 1897. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Hab. On *Idesia polycarpa* Maxim. (*Igiri*). Prov. Tosa:- Mt. Yanaze (T. Yoshinaga). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

39. **Melampsora Yoshinagai** Hennings in Hedwigia XLII, p. (18), 1903. (Dietel in Ann. Myc. VI, p. 227, 1908; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (32), 1904; XXV, p. (489), 1911; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 651, 1930).

Hab. On *Wikstroemia Gampi* Maxim. (*Ko-gampi*). Prov. Tosa:- Mikadzuki-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

On *Wikstroemia gynopoda* Maxim. (*Miyama-gampi*). Prov. Tosa:- Mt. Yekogura (T. Yoshinaga, *type!*); Mt. Shiraga (Motoyama-machi) (T. Yoshinaga).

On *Wikstroemia shikokiana* Franch. et Sav. (*Gampi*). Prov. Tosa:- Hada-mura (T. Yoshinaga); Mitani-goe (M. Kamimura). Prov. Sanuki: Gogô-mura (T. Yoshinaga).

Chnoopsora Dietel, 1906.

40. **Chnoopsora Itoana** Hiratsuka, f. in Jap. Jour. Bot. III, p. 297, 1927. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 208, 1935; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Hab. On *Oxalis Acetosella* L. (*Ko-miyama-katabami*). Prov. Tosa:- Mt. Shiraga (T. Yoshinaga).

On *Oxalis Acetosella* L. var. *japonica* Makino (*Miyama-katabami*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga).

Phakopsora Dietel, 1895.

41. **Phakopsora Artemisiae** Hiratsuka, f. in Jap. Jour. Bot. III, p. 298, 1927.

Syn. *Uredo Artemisiae-japonicae* Dietel in Engl. Bot. Jahrb. XXXIV, p. 591, 1905. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; XXXVII, p. 159, 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 664, 1930).

Uredo autumnalis Dietel in Engl. Bot. Jahrb. XXXVII, p. 108, 1905. (Hennings in Engl. Bot. Jahrb. XXXVII, p. 159, 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 664, 1930).

Hab. On *Artemisia japonica* Thunb. (*Otoko-yomogi*). Prov. Tosa:- Tôchihama (T. Yoshinaga, *type of Uredo Artemisiae-japonicae* Dietel!).

On *Artemisia vulgaris* L. var. *indica* Maxim. (*Yomogi*). Prov. Iyo:- Yoshida-machi (K. Kimura); Nibukawa-mura (T. Yoshinaga). Prov. Awa:- Anabuki-machi (T. Yoshinaga).

On *Chrysanthemum indicum* L. (*Shima-kankiku*). Prov. Tosa:- Higashigawa-mura (T. Yoshinaga).

On *Chrysanthemum japonense* Nakai (*Noji-giku*). Prov. Tosa:- Ashizuri-saki (K. Ide).

On *Chrysanthemum shiwogiku* Kitamura (*Chrysanthemum ornatum* Hemsl. f. *incompletum* Nakai, *Ch. Decaisneanum* Matsum. var. *radiatum* Mak. f. *incompletum* Mak.) (*Shio-giku*). Prov. Tosa:- Ananai-mura (T. Yoshinaga).

On *Chrysanthemum sinense* Sav. (*Kiku*) (*Cult.*). Prov. Tosa:- Akimachi (T. Yoshinaga, *type of Uredo autumnalis* Dietel!).

On *Chrysanthemum* sp. Prov. Iyo:- Mikame-machi (K. Kimura).

On *Eupatorium chinense* L. (*Fujibakama*). Prov. Tosa:- Inabumura (T. Yoshinaga).

On *Eupatorium japonicum* Thunb. (*Hiyodoribana*). Prov. Tosa:- Nagahama-machi (T. Yoshinaga).

42. **Phakopsora Meliosmae** Kusano in Bot. Mag. Tokyo, XVIII, p. 148 & text-fig., 1904. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930).

Hab. On *Meliosma myriantha* Sieb. et Zucc. (*Awabuki*). Prov. Tosa:- Mt. Shiraga (Nirô) (T. Yoshinaga). Prov. Iyo:- Higashi-Akaishiyama (T. Yoshinaga).

43. **Phakopsora Pachyrhizi** Sydow in Ann. Myc. XII, p. 108,

1914.

Syn. *Uredo Sojae* Hennings in Hedwigia XLII, p. (108), 1903. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (35), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 665, 1930).

Phakopsora Sojae Sawada in Transact. Nat. Hist. Soc. Formosa, XXI, p. 230, 1931.

Hab. On *Glycine Soja* Benth. (*Daidzu*) (*Cult.*). Prov. Tosa:- Ikku-mura (K. Nakanishiki); Jizôji-mura (T. Yoshinaga). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga).

On *Glycine ussuriensis* Rgl. et Mack. (*Tsuru-mame*). Prov. Tosa:- Inabu-mura (T. Yoshinaga, type of *Uredo Sojae* Hennings!).

44. **Phakopsora Ampelopsidis** Dietel et Sydow in Dietel in Hedwigia XXXVII, p. 217, 1898. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (32), 1905).

Syn. *Phakopsora Vitis* Sydow in Hedwigia XXXVIII, p. (141), 1899. (Dietel in Engl. Bot. Jahrb. XXXIV, p. 538, 1905; Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (33), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Hab. On *Ampelopsis heterophylla* Sieb. et Zucc. (*No-budô*). Prov. Tosa:- Ioki-mura (T. Yoshinaga); Ônomi-mura (A. Ôyama); Kamoda-mura (T. Yoshinaga). Prov. Iyo:- Mikame-machi (K. Kimura). Prov. Awa:- Tsubaki-mura (T. Yoshinaga).

On *Parthenocissus Thunbergii* Nakai (*Parthenocissus tricuspida* Pl.) (*Tsuta*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

45. **Phakopsora Zizyphi-vulgaris** Dietel in Ann. Myc. VIII, p. 469, 1910. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 652, 1930).

Syn. *Uredo Zizyphi-vulgaris* Hennings in Hedwigia XLI, p. (21), 1902. (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (35), 1904).

Hab. On *Zizyphus vulgaris* Lam. var. *inermis* Bunge (*Natsume*) (*Cult.*). Prov. Tosa:- Nii-mura (T. Yoshinaga, type of *Uredo Zizyphi-vulgaris* Hennings!).

46. **Phakopsora Ehretiae** Hiratsuka in Bot. Mag. Tokyo, XIV, p. 92 & pl. III, figs. 10~13, 1900.

Syn. *Uredo Ehretiae* (not Barcl.) (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (35), 1905).

Schroeteriaster Ehretiae Sydow et Butler in Ann. Myc. X, p. 270, 1912. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 653, 1930).

Hab. On *Ehretia thyrsoflora* Nakai (*Ehretia acuminata* R. Br.) (*Chishanoki*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

Chrysomyxa Unger, 1840.

47. **Chrysomyxa Rhododendri** De Bary in Bot. Zeitg. XXXVII, p. 809 & pl. X, figs. 1~6, 1879. (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; Hiratsuka, f. in Bot. Mag. Tokyo, XLIII, p. 470, 1929; Yoshinaga in Bot. Mag. Tokyo, XV, p. (95), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 655, 1930).

Hab. On *Rhododendron Kaempferi* Pl. (*Yama-tsutsuji*). Prov. Tosa:- Sakawamachi (T. Yoshinaga).

Cronartium Fries, 1815.

48. **Cronartium Quercuum** (Berk.) Miyabe in Shirai in Bot. Mag. Tokyo, XIII, p. 74~79 & 2 pl., 1899.

Syn. *Cronartium asclepiadeum* var. *quercium* Berkeley in Grevillea III, p. 59, 1874.

Hab. On *Pinus densiflora* Sieb. et Zucc. (*Aka-matsu*). Prov. Iyo:- Mikame-machi (K. Kimura).

On *Quercus acutissima* Carr. (*Kunugi*). Prov. Iyo:- Yoshida-machi (K. Kimura).

On *Quercus serrata* Thunb. (*Ko-nara*). Prov. Iyo:- Yoshida-machi (K. Kimura).

Coleopuccinia Patouillard, 1889.

49. **Coleopuccinia simplex** Dietel in Ann. Myc. VII, p. 355, 1909. (Dietel in Ann. Myc. VIII, p. 313, 1910; Sydow, Monogr. Ured. III, p. 544 & pl. XXV, fig. 176; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930).

Hab. On *Eriobotrya japonica* Lindl. (*Biwa*) (*Cult.*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga, type!); Ônogô-mura (T. Yoshinaga). Prov. Iyo:- Kisagata-mura (K. Kimura). Prov. Awa:- Sanakawachi-mura

(S. Nakagawa).

Coleosporium Léveillé, 1847.

50. **Coleosporium Clematidis** Barclay in Jour. Asiatic Soc. Bengal, LIX, pt. 2, p. 89 & pl. VI, figs. 3 & 5, 1890. (Dietel in Ann. Myc. VI, p. 228, 1908; Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Hab. On *Clematis lasiandra* Maxim. (*Takane-hanshōdzuru*). Prov. Tosa:- Ōnomi-mura (A. Ōyama).

On *Clematis paniculata* Thunb. (*Senninsō*). Prov. Tosa:- Sakawamachi (T. Yoshinaga); Ashizuri-saki (K. Ide); Kōchi-shi (M. Kamimura); Tokano-mura (M. Kamimura). Prov. Awa:- Ikeda-machi (T. Yoshinaga). Prov. Sanuki:- Hagihara-mura (T. Yoshinaga).

On *Clematis patens* Morr. et Decne. (*Kazaguruma*). Prov. Tosa:- Hada-mura (T. Yoshinaga).

Clematis lasiandra Maxim. seems to be a new host plant to the present species.

51. **Coleosporium Clematidis-apiifoliae** Dietel in Engl. Bot. Jahrb. XXVIII, p. 287, 1900. (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; Yoshinaga in Bot. Mag. Tokyo, XV, p. (96), 1901, p.p.; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Hab. On *Clematis apiifolia* DC. (*Botanzuru*). Prov. Tosa:- Takaoka-machi (T. Yoshinaga).

52. **Coleosporium Pulsatillae** Léveillé in Ann. Sci. Nat. 3. Sér. VIII, p. 373, 1847. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Hab. On *Anemone cernua* Thunb. (*Okinagusa*). Prov. Tosa:- Kōchi-shi (T. Yoshinaga).

53. **Coleosporium Xanthoxyli** Dietel et Sydow in Dietel in Hedwigia XXXVII, p. 217, 1898. (Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; XXXIV, p. 596, 1905; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (30), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Hab. On *Fagara ailanthoides* Engl. (*Zanthoxylon ailanthoides* Seib. et Zucc.) (*Karasu-zanshō*). Prov. Tosa:- Ōnogō-mura (K. Tamura); Ashizuri-saki (K. Ide).

On *Fagara schinifolia* Engl. (*Zanthoxylon schinifolium* Sieb. et Zucc.) (*Inu-zanshō*). Prov. Tosa:- Kirifusagi-zaka (T. Yoshinaga); Ōnomi-mura (A. Ōyama).

54. **Coleosporium Evodiae** Dietel in Ann. Myc. VII, p. 355, 1909. (Dietel in Ann. Myc. VIII, p. 313, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 658, 1930).

Hab. On *Evodia glauca* Miq. (*Evodia meliaefolia* Benth.) (*Hamasendan*). Prov. Tosa:- Higashimata-mura (T. Yoshinaga, type!).

55. **Coleosporium Phellodendri** Komarov in Jaczewski, Komarov et Tranzschel, Fung. Ross. exs. no. 274, 1899. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 658, 1930).

Syn. *Coleosporium Phellodendri* Dietel in Engl. Bot. Jahrb. XXVIII, p. 287, 1900. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 106, 1905).

Hab. On *Phellodendron amurense* Rupr. (*Kiwada*). Prov. Tosa:- Mt. Yanaze (T. Yoshinaga); Mt. Shiraga (Nirō) (T. Yoshinaga).

56. **Coleosporium Clerodendri** Dietel in Engl. Bot. Jahrb. XXVIII, p. 566, 1899. (Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (2), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 658, 1930).

Hab. On *Clerodendron trichotomum* Thunb. (*Kusagi*). Prov. Tosa:- Sakawamachi (T. Yoshinaga); Ōnogō-mura (A. Ōyama); Nakamura-machi (T. Morimoto); Susaki-machi (M. Kamimura). Prov. Iyo:- Mikame-machi (K. Kimura).

57. **Coleosporium Perillae** Sydow in Hedwigia XXXVIII, p. (141), 1899. (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (30), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Keiskea japonica* Miq. (*Shimobashira*). Prov. Tosa:- Oga-mura (T. Yoshinaga); Ōnomi-mura (A. Ōyama).

On *Mosla punctulata* Nakai (*Inukōjyu*). Prov. Tosa:- Akatsuchitōge (T. Yoshinaga).

On *Perilla frutescens* Brit. var. *crispa* Decne. f. *viridis* Mak. (*Perilla ocymoides* L. var. *crispa* Benth. f. *viride-crispa* Mak.) (*Ao-jiso*) (*Cult.*). Prov. Tosa:- Arakura-zaka (T. Yoshinaga).

On *Perilla frutescens* Brit. var. *crispa* Decne. f. *purpurea* Mak. (*Perilla nankinensis* Decne.) (*Shiso*) (*Cult.*). Prov. Tosa:- Sakawamachi (T. Yoshinaga).

On *Perilla frutescens* Brit. var. *typica* Mak. (*Perilla ocymoides* L.) (*Egoma*)(*Cult.*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Arakura-zaka (T. Yoshinaga).

58. **Coleosporium Plectranthi** Barclay in Jour. Asiatic Soc. Bengal, LIX, pt. 2, p. 89 & pl. VI, fig. 4, 1890. (Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; XXXIV, p. 596, 1905; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (30), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 658, 1930).

Hab. On *Elscholtzia Patrini* Gareke (*Naginata-kôjyu*). Prov. Tosa:- Takaoka-machi (T. Yoshinaga).

On *Plectranthus inflexus* Vahl. (*Yama-hakka*). Prov. Awa:- Tsubaki-mura (T. Yoshinaga).

On *Plectranthus japonicus* Koidz. (*Plectranthus glaucocalyx* Maxim.) (*Hikiokoshi*). Prov. Tosa:- Ogawa-mura (T. Yoshinaga).

On *Plectranthus longitubus* Miq. (*Aki-chôji*). Prov. Tosa:- Tosayama-mura (T. Yoshinaga). Prov. Awa:- Kitô-mura (T. Yoshinaga).

59. **Coleosporium Melampyri** Tulasne in Ann. Sci. Nat. 4. Sér. II, p. 136, 1854, p. p. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Melampyrum japonicum* Nakai var. *genuinum* Nakai (*Mamako-na*). Prov. Tosa:- Okô-mura (T. Yoshinaga).

On *Melampyrum laxum* Miq. (*Miyama-mamakona*). Prov. Tosa:- Amatsubo-mura (T. Yoshinaga).

60. **Coleosporium Paederiae** Dietel in Ann. Myc. VII, p. 355, 1909. (Dietel in Ann. Myc. VIII, p. 313, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Paederia tomentosa* Bl. (*Hekuso-kadzura*). Prov. Tosa:- Hane-mura (K. Ogawa, *type!*).

61. **Coleosporium Campanulae** (Pers.) Léveillé in Ann. Sci. Nat. 3. Sér. VIII, p. 373, 1847. (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XV, p. (95), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Syn. *Uredo Campanulae* Persoon, Syn. Fung. p. 217, 1801.

Hab. On *Adenophora verticillata* Fisch. var. *typica* Trautv. (*Tsurigane-ninjin*). Prov. Tosa:- Kitahara-mura (T. Yoshinaga). Prov. Awa:- Hayashi-machi (T. Yoshinaga).

On *Wahlenbergia gracilis* A. DC. (*Hina-gikyô*). Prov. Tosa:- Misato-mura (T. Yoshinaga). Prov. Sanuki:- Kusakabe-machi (Shôdzushima) (T. Yoshinaga).

62. **Coleosporium Campanumae** Dietel in Engl. Bot. Jahrb. XXXVII, p. 106, 1905. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Campanumea javanica* Bl. (*Tsuru-gikyô*). Prov. Tosa:- Kitagawa-mura (T. Yoshinaga, *type!*).

63. **Coleosporium Horianum** Hennings in Hedwigia XL, p. (25), 1901. (Hennings in Engl. Bot. Jahrb. XXXI, p. 733, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (2), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Codonopsis lanceolata* Benth. et Hook. f. (*Tsuru-ninjin*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Susaki-machi (M. Kamimura); Mt. Yokogura (T. Yoshinaga).

64. **Coleosporium Cacaliae** Otth in Mitteil. Naturf. Ges. Bern (1865), p. 179, 1866. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 219, 1935).

Hab. On *Cacalia delfinifolia* Sieb. et Zucc. (*Momiji-gasa*). Prov. Tosa:- Kamuri-yama (T. Yoshinaga).

On *Cacalia Makinoana* Mak. (*Ô-momiji-gasa*). Prov. Iyo:- Mt. Ishidzuchi (T. Yoshinaga).

On *Cacalia peltifolia* Mak. (*Taimin-gasa*). Prov. Tosa:- Mt. Kampû (T. Yoshinaga).

65. **Coleosporium Carpesii** Saccardo in Riv. Acc. di Pavia XXIV, p. 208, 1874. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930).

Syn. *Coleosporium Carpesii* Dietel in Engl. Bot. Jahrb. XXXIV, p. 588, 1905. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; XXXVII, p. 158, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (30), 1905).

Coleosporium Sonchi (not Léveillé) (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (30), 1904).

Hab. On *Carpesium abrotanoides* L. (*Yabutabako*). Prov. Tosa:- Ryûzaki (T. Yoshinaga).

On *Carpesium divaricatum* Sieb. et Zucc. (*Gankubisô*). Prov. Tosa:-

Mt. Washio (K. Nakanishiki); Ryû-zaki (T. Yoshinaga).

66. **Coleosporium Ligulariae** Thümen in Bull. Soc. Imp. Nat. Moscou, LII, p. 140, 1877. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 220, 1935).

Hab. On *Ligularia stenocephala* Matsum. (*Me-takarakô*). Prov. Awa:- Mt. Tsurugi (T. Yoshinaga).

67. **Coleosporium Petasitis** Léveillé in Ann. Sci. Nat. 3. Sér. VIII, p. 373, 1847. (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (30), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930).

Hab. On *Petasites japonicus* Miq. (*Fuki*). Prov. Tosa:- Sakawamachi (T. Yoshinaga); Ônomi-mura (A. Ôyama). Prov. Awa:- Kamibun-kamiyama-mura (T. Yoshinaga).

68. **Coleosporium Saussureae** Thümen in Bull. Soc. Imp. Nat. Moscou, LV, p. 212, 1880. (Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. IX, p. 222, 1927; Mem. Tottori Agric. Coll. III, p. 220, 1935; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930).

Syn. *Uredo Compositarum* (not Dietel) (Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901).

Coleosporium Saussureae Dietel in Engl. Bot. Jahrb. XXXIV, p. 588, 1905. (Dietel in Ann. Myc. VI, p. 228, 1908; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (30), 1905).

Hab. On *Saussurea gracilis* Maxim. (*Hokuchi-azami*). Prov. Iyo:- Idzushi-yama (T. Yoshinaga).

On *Saussurea japonica* DC. (*Hime-higotai*). Prov. Tosa:- Kamodamura (T. Yoshinaga); Hatayama-mura (T. Yoshinaga, type of *Coleosporium Saussureae* Dietel!); Hada-mura (T. Yoshinaga); Hage-mura (T. Yoshinaga); Kagami-mura (T. Yoshinaga).

On *Saussurea Yoshinagai* Kitamura (*Tosa-tôhiren*). Prov. Tosa:- Hada-mura (T. Yoshinaga).

69. **Coleosporium Senecionis** Fries, Sum. Veg. Scand. p. 512, 1849, p. p. (Dietel in Ann. Myc. VIII, p. 313, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 657, 1930).

Hab. On *Senecio campestris* DC. (*Sawa-oguruma*). Prov. Tosa:- To-sayama-mura (T. Yoshinaga).

70. **Coleosporium Solidaginis** (Schw.) Thümen in Bull. Torr. Bot. Club, VI, p. 216, 1878.

Syn. *Uredo Solidaginis* Schweinitz in Schr. Nat. Ges. Leipzig, I, p. 70, 1822.

Stichopsora Asterum Dietel in Engl. Bot. Jahrb. XXVII, p. 566 & pl. VII, fig. 7, 1899. (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; XXXI, p. 734, 1902; XXXIV, p. 596, 1905; Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901).

Uredo Heteropappi Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (35), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 665, 1930).

Coleosporium Asterum Sydow in Ann. Myc. XII, p. 109, 1914. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 656, 1930).

Hab. On *Aster ageratoides* Turcz. var. *adustus* Nakai (*No-kon-giku*). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

On *Aster altaicus* Willd. (*Heteropappus hispidus* Less.) (*Yamaji-nogiku*). Prov. Tosa:- Misato-mura (T. Yoshinaga, type of *Uredo Heteropappi* Hennings!).

On *Aster Laulureanus* Franch. (*Asteromaea indica* Thunb.) (*Yomena*). Prov. Tosa:- Sakawamachi (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura). Prov. Awa:- Sanakôchi-mura (T. Yoshinaga).

On *Aster leiophyllus* Franch. et Sav. (*Yamashiro-giku*). Prov. Tosa:- Ogawa-mura (T. Yoshinaga).

On *Aster scaber* Thunb. (*Shirayama-giku*). Prov. Tosa:- Sakawamachi (T. Yoshinaga); Mt. Washio (M. Kamimura); Ônomi-mura (A. Ôyama).

On *Callistephus chinensis* Nees (*Ezo-giku*) (*Cult.*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

71. **Coleosporium Bletiae** Dietel in Hedwigia XXXVII, p. 216, 1898. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 597, 1905; Yoshinaga in Bot. Mag. Tokyo, XVII, p. (29), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Hab. On *Bletia hyacinthina* Rehb. f. (*Shiran*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

Pucciniaceae

Hemileia Berkeley et Broome, 1869.

72. **Hemileia Gardeniae-floridae** Sawada in Transact. Nat. Hist. Soc. Formosa, XXI, p. 234, 1931 (*nomen seminudum*); Govern. Res. Inst. Formosa, Dept. Agric. Rept. no. 61, p. 43 & pl. I, figs. 27 & 28, 1933 (*nomen seminudum*).

Syn. *Hemileia vastatrix* (not Berk. et Br.) (Yoshinaga in Bot. Mag. Tokyo, XXVII, p. (67), 1913; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Soris uredosporiferis hypophyllis, maculis decoloratis insidentibus, sparsis vel aggregatis, minutis, flavidis; uredosporis in apice sterigmatum fasciculatim erumpentium ortis; ovatis, bilateraliter ovatis vel reniformibus, superficie convexa aculeatis, parte inferiore appanata levibus, pallide flavidis, $24\sim 32 \times 18\sim 25 \mu$; episporio tenui. Teleutosporis ignotis.

Hab. On *Gardenia jasminoides* Ell. var. *grandiflora* Nakai (*Gardenia florida* L. var. *grandiflora* Franch. et Sav.) (*Kuchinashi*). Prov. Tosa:- Okō-mura (T. Yoshinaga); Kure-machi (T. Yoshinaga); Tōchi-mura (T. Yoshinaga).

From its related species, *Hemileia vastatrix* Berk. et Br., the present fungus distinctly differs in having much smaller uredospores.

Tranzschelia Arthur, 1906.

73. **Tranzschelia fusca** (Pers.) Dietel in Ann. Myc. XX, p. 31, 1922.

Syn. *Aecidium fuscum* Persoon in Gmel., Syst. Nat. II, p. 1473, 1791.

Puccinia fusca Winter in Pilze Deutschl. I, p. 199, 1881.

Hab. On *Anemone cernua* Thunb. (*Okina-gusa*). Prov. Iyo:- Yoshida-machi (K. Kimura).

74. **Tranzschelia Pruni-spinosae** (Pers.) Dietel in Ann. Myc. XX, p. 31, 1922. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 133, 1934).

Syn. *Puccinia Pruni-spinosae* Persoon, Syn. Fung. p. 226, 1801.

Tranzschelia punctata Arthur in Résult. Sci. Congr. Internat. Bot. Vienne (1905), p. 340, 1906.

Puccinia Pruni-persicae Hori in Phytopathology II, p. 144, 1912,

p. p. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Hab. On *Prunus Persica* Sieb. et Zucc. (*Momo*) (*Cult*). Prov. Tosa:- Misato-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura); Mikame-machi (K. Kimura); Dōgo (T. Nishida).

Blastospora Dietel, 1908.

75. **Blastospora Smilacis** Dietel in Ann. Myc. VI, p. 223 & text-fig., 1908. (Togashi & Onuma in Bot. Mag. Tokyo, XLV, p. 5 & fig. 2, 1931; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Hab. On *Smilax Sieboldi* Miq. (*Yamagashū*). Prov. Tosa:- Mikadzuki-mura (T. Yoshinaga, *type!*).

Mainsia Jackson, 1931.

76. **Mainsia chinensis** (Diet.) Jackson in Mycologia XXIII, p. 107, 1931.

Syn. *Uredo chinensis* Dietel in Hedwigia XXXVII, p. 213, 1898. (Dietel in Engl. Bot. Jahrb. XXXIV, p. 591, 1905).

Uredo constellata Berkeley et Curtis in Proc. Amer. Acad. Arts & Sci. IV, p. 126, 1858. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 665, 1930).

Uromyces chinensis Dietel in Ann. Myc. X, p. 206, 1912.

Spirechina chinensis Dietel in Engler-Prantl, Natürl. Pflanzenfam., II. Aufl. VI, p. 60, 1928.

Hab. On *Rubus Buergeri* Miq. (*Fuyu-ichigo*). Prov. Tosa:- Iokimura (T. Yoshinaga); Susaki-machi (M. Kamimura); Shinjo-mura (M. Kamimura); Mt. Honkawa (M. Kamimura). Prov. Iyo:- Iradzu-yama (T. Yoshinaga); Tachimajiri-mura (K. Kimura).

Kuehneola Magnus, 1898.

77. **Kuehneola japonica** (Diet.) Dietel in Ann. Myc. X, p. 205, 1912. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 131, 1934; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Syn. *Phragmidium japonicum* Dietel in Engl. Bot. Jahrb. XXVIII, p. 567 & pl. VII, fig. 8, 1899. (Hennings in Engl. Bot. Jahrb. XXXI, p. 732, 1902; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 31, 1910; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (3), 1902).

Hab. On *Rosa fujisanensis* Mak. (*Fuji-ibara*). Prov. Tosa:- Sasa-

gamine~Kamuri-yama (T. Yoshinaga).

On *Rosa Onoei* Mak. (*Yabu-ibara*). Prov. Tosa:- Mt. Shiraga (T. Yoshinaga).

On *Rosa polyantha* Sieb. et Zucc. (*Rosa multiflora* Thunb.) (*No-ibara*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga); Higashiyama-mura (T. Morimoto); Akatsuchi-tôge (T. Yoshinaga); Kôchi-shi (M. Kamimura); Usa-machi (T. Yoshinaga). Prov. Awa:- Fukui-mura (T. Yoshinaga).

On *Rosa Wichurariana* Crep. (*Rosa Luciae* Franch. et Sav.) (*Teriha-no-ibara*). Prov. Tosa:- Ônomi-mura (A. Ôyama); Akiyama-mura (T. Yoshinaga).

Rosa Onoei Mak. is a new host plant for the present species.

Hamasporea Körnicke, 1877.

78. **Hamasporea Rubi-Sieboldii** (Kawagoe) Dietel in Ann. Myc. XX, p. 293, 1922. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Syn. *Phragmidium Rubi-Sieboldii* Kawagoe in Bull. Kagoshima Imp. Coll. Agric. & Forestr. I, p. 201 & 1 pl., 1915 (*nomen seminudum*); Tanaka in Mycologia XI, p. 152, 1919.

Exs. Sydow, Fung. exot. exs. no. 480.

Hab. On *Rubus Sieboldi* Bl. (*Hôroku-ichigo*). Prov. Tosa:- Muroto-saki (T. Yoshinaga); Ônogô-mura (T. Yoshinaga); Gyôtô-zaki (T. Yoshinaga); Heshima (M. Kamimura); Kure-machi (A. Ôyama).

Phragmidium Link, 1815.

(Syn. *Phragmotelium* Sydow, 1921)

79. **Phragmidium Rosae-multiflorae** Dietel in Hedwigia XLIV, p. 132 & pl. IV, fig. 8, 1905. (Dietel in Ann. Myc. VIII, p. 310, 1910; Hiratsuka, f. in Jap. Jour. Bot. VII, p. 244, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 32, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 649, 1930).

Syn. *Phragmidium subcorticium* (not Schröter) (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (3), 1902).

Phragmidium sp. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 248, 1935).

Hab. On *Rosa ampullicarpa* Koidz. (*Tokkuri-ibara*). Prov. Awa:- Sanakôchi-mura (T. Yoshinaga).

On *Rosa polyantha* Sieb. et Zucc. (*Rosa multiflora* Thunb.) (*No-ibara*). Prov. Tosa:- Hane-mura (K. Ogawa); Sako-mura (T. Yoshinaga); Mt. Yokogura (T. Yoshinaga). Prov. Awa:- Ikeda-machi (T. Yoshinaga). Prov. Iyo:- Goshô-mura (K. Sengoku); Maruho-mura (M. Okudaira); Misaka-tôge (M. Okudaira); Yoshida-machi (K. Kimura).

On *Rosa Wichurariana* Crep. (*Rosa Luciae* Franch. et Sav.) (*Teriha-no-ibara*). Prov. Tosa:- Ônomi-mura (A. Ôyama); Irino-mura (T. Yoshinaga).

On *Rosa laevigata* Michx. (*Naniwa-ibara*). Prov. Tosa:- Nishibun-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

Rosa ampullicarpa Koidz. is a new host plant for the present species.

80. **Phragmidium brevipedicellatum** Hiratsuka, f. in Transact. Sapporo Nat. Hist. Soc. XIII, p. 135, 1934. (Hiratsuka, f. in Jour. Jap. Bot. X, p. 223, 1934; Jap. Jour. Bot. VII, p. 265, 1935).

Syn. *Phragmidium Potentillae* (not Karsten nor Winter) (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905, p. p.; Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 29, 1910; Yoshinaga in Bot. Mag. Tokyo, XV, p. (96), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 549, 1930).

Hab. On *Potentilla Kleiniana* Wight. et Arn. (*O-hebi-ichigo*). Prov. Tosa:- Kamoda-mura (T. Yoshinaga); Asakura-mura (T. Yoshinaga); Higashigawa-mura (T. Yoshinaga); Ônomi-mura (A. Ôyama); Sakawa-machi (T. Yoshinaga); Tokano-mura (M. Kamimura). Prov. Iyo:- Ebara-mura (M. Okudaira). Prov. Awa:- Ashiro-mura (T. Yoshinaga).

81. **Phragmidium griseum** Dietel in Engl. Bot. Jahrb. XXXII, p. 49, 1902. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 277 & text-fig. 5, b, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 37, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 648, 1930).

Syn. *Phragmidium Yoshinagai* Dietel in Engl. Bot. Jahrb. XXXIV, p. 586, 1905. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905; Ann. Myc. VIII, p. 310, 1910; Hennings in Engl. Bot. Jahrb. XXXIV, p. 596, 1905; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 41, 1910; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (33), 1905; Yoshi-

naga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 649, 1930).
Phragmotelium griseum Sydow in Ann. Myc. XIX, p. 167, 1921.
Phragmotelium Yoshinagai Sydow in Ann. Myc. XIX, p. 167, 1921.
 Hab. On *Rubus microphyllus* L. f. (*Rubus incisus* Thunb.) (*Kobano-niga-ichigo*). Prov. Tosa:- Kamo-mura (T. Yoshinaga); Agekura-mura (T. Yoshinaga); Takano-tôge (T. Yoshinaga).
 On *Rubus rosaefolius* Sm. var. *tropicus* Maxim. f. *genuinus* Mak. (sub "*Rubus asper* Wall.") (*Ô-bara-ichigo*). Prov. Tosa:- Yotsu-mura (T. Yoshinaga).
 On *Rubus Wrightii* A. Gray (*Rubus morifolius* Sieb.) (*Kuma-ichigo*). Prov. Tosa:- Kagami-mura (T. Yoshinaga); Ino-machi (T. Yoshinaga); Mt. Yanaze (T. Yoshinaga); Hatayama-mura (T. Yoshinaga, type of *Phragmidium Yoshinagai* Dietel!). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga).

82. **Phragmidium heterosporum** Dietel in Engl. Bot. Jahrb. XXXII, p. 626, 1903. (Dietel in Ann. Myc. VIII, p. 310, 1910; Hiratsuka, f. in Jap. Jour. Bot. VII, p. 273, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 38, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 649, 1930).

Hab. On *Rubus trifidus* Thunb. (*Kaji-ichigo*). Prov. Tosa:- Akiyama-mura (T. Yoshinaga); Kamoda-mura (T. Yoshinaga); Nishibun-mura (T. Yoshinaga).

83. **Phragmidium pauciloculare** (Diet.) Sydow, Mongr. Ured. III, p. 138 & pl. VI, fig. 60, 1912. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 282, 1935; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 649, 1930).

Syn. *Phragmidium Barnardi* Plowright et Winter var. *pauciloculare* Dietel in Engl. Bot. Jahrb. XXXII, p. 49, 1902. (Dietel in Ann. Myc. VI, p. 227, 1908; Hennings in Engl. Bot. Jahrb. XXXI, p. 732, 1902; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 36, 1910; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (3), 1902).

Phragmotelium pauciloculare Sydow in Ann. Myc. XIX, p. 167, 1921.

Hab. On *Rubus parvifolius* L. (*Nawashiro-ichigo*). Prov. Tosa:- Ônomi-mura (A. Ôyama); Kamoda-mura (T. Yoshinaga); Kawakita-mura (T. Yoshinaga); Shimoda-machi (T. Morimoto). Prov. Awa:- Ikeda-machi (T. Yoshinaga); Ashiro-mura (T. Yoshinaga). Prov. Iyo:- Mikame-machi (K. Kimura); Takakushi (K. Kimura); Maruho-

mura (K. Okudaira). Prov. Sanuki:- Gogô-mura (T. Yoshinaga).

On *Rubus phoenicolasius* Maxim. (*Urajiro-ichigo*). Prov. Tosa:- Ôkomi-yama (T. Yoshinaga); Kawakita-mura (T. Yoshinaga). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

84. **Phragmidium Rubi-Thunbergii** Kusano in Bot. Mag. Tokyo, XVIII, p. 148, 1904. (Hiratsuka, f. in Jap. Jour. Bot. VII, p. 275, 1935; Kasai in Transact. Sapporo Nat. Hist. Soc. III, p. 40, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 649, 1930).

Syn. *Phragmotelium Rubi-Thunbergii* Sydow in Ann. Myc. XIX, p. 167, 1921.

Hab. On *Rubus hirsutus* Thunb. (*Rubus Thunbergii* Sieb. et Zucc.) (*Kusa-ichigo*). Prov. Tosa:- Sagawa-yama (Taishô-mura) (T. Yoshinaga); Amatsubo-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura); Iwayama (M. Okudaira). Prov. Awa:- Okukitô-mura (T. Yoshinaga).

Triphragmium Link, 1825.

(Syn. *Nyssopsora* Arthur, 1906; *Oplophora* Sydow, 1921)

85. **Triphragmium Cedrelae** Hori in Yatabe, Icon. Fl. Jap. I, no. 2, p. 150 & pl. XXXVIII, fig. B, 1~4, 1892. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (35), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Syn. *Oplophora Cedrelae* Sydow in Ann. Myc. XIX, p. 170, 1921.

Nyssopsora Cedrelae Dietel in Engler-Prantl, Natürl. Pflanzenfam. II. Aufl. VI, p. 70, 1928.

Exs. Sydow, Fung. exot. exs. no. 483.

Hab. On *Cedrela sinensis* Juss. (*Toona sinensis* Roem.) (*Chanchin*). Prov. Tosa:- Takaoka-machi (T. Yoshinaga); Aki-machi (T. Yoshinaga); Nagahama-mura (T. Yoshinaga); Susaki-machi (K. Chikazawa). Prov. Awa:- Hayashi-machi (T. Yoshinaga).

86. **Triphragmium Thwaitesii** Berkeley et Broome in Jour. Linn. Soc. Bot. XIV, p. 92, 1875. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Syn. *Nyssopsora Thwaitesii* Sydow in Ann. Myc. XIX, p. 170, 1921.

Triphragmium clavellousum (not Berk.) (Hennings in Engl. Bot. Jahrb. XXXII, p. 36, 1902; Yoshinaga in Bot. Mag. Tokyo, XV, p.

(97), 1901).

Hab. On *Acanthopanax sciadophylloides* Franch. et Sav. (*Kalopanax sciadophylloides* Harms) (*Koshiabura*). Prov. Tosa:- Hongawa-mura (T. Yoshinaga).

On *Kalopanax innovans* Miq. (*Acanthopanax innovans* Sieb. et Zucc., *Evodiopanax innovans* Nakai) (*Imonoki*). Prov. Tosa:- Agekura-mura (T. Yoshinaga); Sakawa-machi (T. Yoshinaga); Tokano-mura (M. Kamimura).

Pileolaria Castagne, 1842.

87. **Pileolaria Klugkistiana** (Diet.) Dietel in Ann. Myc. XIX, p. 301, 1921. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 275, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Syn. *Uredo Klugkistiana* Dietel in Hedwigia XXXVII, p. 213, 1898.

Uromyces Klugkistianus Dietel in Engl. Bot. Jahrb. XXVII, p. 570 & pl. VII, figs. 11 & 12, 1900. (Dietel in Ann. Myc. VI, p. 223, 1908).

Hab. On *Rhus javanica* L. (*Fushinoki*). Prov. Tosa:- Yasudama-machi (T. Yoshinaga). Prov. Awa:- Kitô-mura (T. Yoshinaga); Furu-miya-mura (T. Yoshinaga). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga).

88. **Pileolaria Shiraiana** (Diet. et Syd.) Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 273 & pl. IX, fig. 13, 1922. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Syn. *Uromyces Shiraianus* Dietel et Sydow in Dietel in Hedwigia XXXVII, p. 213, 1898. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905).

Hab. On *Rhus succedanea* L. (*Haze-no-ki*). Prov. Awa:- Miyahama-mura (T. Yoshinaga).

On *Rhus sylvestris* Sieb. et Zucc. (*Yama-haze*). Prov. Tosa:- Asakura-mura (T. Yoshinaga). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga). Prov. Awa:- Kitô-mura (T. Yoshinaga).

On *Rhus trichocarpa* Miq. (*Yama-urushi*). Prov. Tosa:- Yasudamura (T. Yoshinaga); Mt. Yanaze (T. Yoshinaga); Kamihayama-mura (A. Ôyama); Mt. Washio (T. Yoshinaga); Kataji-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura); Sekigawa-mura

(T. Yoshinaga).

89. **Pileolaria Toxicodendri** (Berk. et Rav.) Arthur in N. Amer. Fl. VII, p. 147, 1907. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 274, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Syn. *Uromyces Toxicodendri* Berkeley et Ravenel in Grevillea III, p. 56, 1874.

Hab. On *Rhus Toxicodendron* L. var. *vulgaris* Pursh. f. *radicans* Engl. (*Rhus orientalis* C. K. Schn.) (*Tsuta-urushi*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga).

Ravenelia Berkeley, 1853.

90. **Ravenelia japonica** Dietel et Sydow in Dietel in Hedwigia XXXVII, p. 216, 1898. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 104, 1905; Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (34), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Syn. *Haploravenelia japonica* Sydow in Ann. Myc. XIX, p. 165, 1921.

Hab. On *Albizia Julbrissin* Durazz. (*Nemunoki*). Prov. Tosa:- Iokimura (T. Yoshinaga); Umaji-mura (T. Yoshinaga).

Nothoravenelia Dietel, 1910.

91. **Nothoravenelia japonica** Dietel in Ann. Myc. VIII, p. 310, 1910. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 650, 1930).

Hab. On *Securinega ramiflora* Müll.-Arg. (*Securinega fluggeoides* Müll.-Arg.) (*Hitotsuba-hagi*). Prov. Tosa:- Kônotani-mura (T. Yoshinaga, *type!*); Tosayama-mura (T. Yoshinaga).

Gymnosporangium Hedwig, f., 1805.

92. **Gymnosporangium Amelanchieris** Fischer in Zeitschr. f. Bot. I, p. 711 & text-fig. 7, 1909.

Syn. *Gymnosporangium Idetae* Yamada in Hara, Kwaju-Byôgairon (Discourse on fruit diseases), p. 95 & fig. 11 (6), 1916 (*Japanese*); Tanaka in Mycologia XIV, p. 287, 1922.

Hab. On *Amelanchier asiatica* Endl. (*Zaifuriboku*). Prov. Iyo:- Koshiore-yama (K. Okudaira); Nibukawa-mura (T. Yoshinaga). Prov.

Sanuki:- Shôdzu-shima (T. Yoshinaga).

93. **Gymnosporangium Haraeanum** Sydow in Ann. Myc. X, p. 405, 1912. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 651, 1930).

Syn. *Gymnosporangium japonicum* (not Sydow) (Hennings in Engl. Bot. Jahrb. XXXI, p. 732, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (32), 1904).

Roestelia koreaensis Hennings in Monsunia I, p. 5, 1900. (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (6), 1902).

Hab. On *Chaenomeles extus-coccine* Carr. (*Cydonia japonica* Lindl.) (*Boke*) (*Cult.*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Noda-mura (H. Asuyama). Prov. Iyo:- Matsuyama-shi (K. Okudaira).

On *Cydonia sinensis* Thouin (*Kwarin*) (*Cult.*). Prov. Tosa:- Nagao-ka-mura (M. Kamimura). Prov. Iyo:- Matsuyama-shi (K. Okudaira).

On *Cydonia vulgaris* Pers. (*Marumero*) (*Cult.*). Prov. Iyo:- Dôgo (T. Midzuno).

On *Pirus serotina* Rehd. (*Nashi*) (*Cult.*). Prov. Iyo:- Dôgo (K. Ishimura; K. Hayashi); Yoshida-machi (K. Kimura); Matsuyama-shi (K. Okudaira). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Sakawa-machi (T. Yoshinaga). Prov. Awa:- Ikeda-machi (T. Yoshinaga).

On *Juniperus chinensis* L. (*Byakushin*) (*Cult.*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga). Prov. Awa:- Kamomyô-machi (T. Aoyagi). Prov. Iyo:- Dôgo (K. Ishimura).

94. **Gymnosporangium japonicum** Sydow in Hedwigia XXXVIII, p. (141), 1899. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 651, 1930).

Syn. *Roestelia Photiniae* Hennings in Hedwigia XXXIII, p. 231, 1894. (Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901).

Hab. On *Photinia laevis* DC. var. *villosa* Koidz. (*Photinia villosa* DC.) (*Kamatsuka*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

On *Juniperus chinensis* L. (*Byakushin*) (*Cult.*). Prov. Tosa:- Kôchi-shi (A. Ideta).

Stereostratum Magnus, 1899.

95. **Stereostratum corticioides** (Berk. et Br.) Magnus in Ber. Deutsch. Bot. Ges. XVII, p. 181 & pl. XII, figs. 1-7, 1899. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (34), 1905; Yoshinaga & Hi-

ratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 651, 1930).

Syn. *Puccinia corticioides* Berkeley et Broome in Berkeley in Jour. Linn. Soc. Bot. XVI, p. 52, 1878. (Dietel in Ann. Myc. VIII, p. 308, 1910).

Hab. On *Pleiblastus Simoni* Nakai (*Arundinaria Simoni* Riv.) (*Medake*). Prov. Tosa:- Higashikawa-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura).

On *Phyllostachys edulis* Riv. (*Môsô-chiku*) (*Cult.*). Prov. Tosa:- Umanoue-mura (T. Yoshinaga).

On *Phyllostachys reticulata* C. Koch (*Phyllostachys bambusoides* Sieb. et Zucc.) (*Ma-dake*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

Pucciniostele Tranzschel et Komarov, 1899.

96. **Pucciniostele Clarkiana** (Barcl.) Dietel in Engl. Bot. Jahrb. XXVII, p. 564, 1899. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 651, 1930).

Syn. *Xenodochus Clarkianus* Berkeley in Jour. Asiatic Soc. Bengal, LX, pt. 2, p. 222, 1891.

Klastospora Komarovii (not Dietel) (Dietel in Engl. Bot. Jahrb. XXXVII, p. 105, 1905).

Hab. On *Astilbe congesta* Nakai (*Astilbe Thunbergii* Miq. var. *congesta* Boiss.) (*Toriashi-shôma*). Prov. Tosa:- Yoshino-mura (T. Yoshinaga). Prov. Iyo:- Iradzu-yama (T. Yoshinaga).

On *Astilbe japonica* A. Gray (*Awamori-shôma*). Prov. Tosa:- Mt. Yanaze (T. Yoshinaga). Prov. Iyo:- Odamiyama (T. Yoshinaga).

Ochropsora Dietel, 1895.

97. **Ochropsora Kraunhiae** (Diet.) Dietel in Engl. Bot. Jahrb. XXXVII, p. 106, 1905. (Dietel in Ann. Myc. VIII, p. 313, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Syn. *Phakopsora Kraunhiae* Dietel in Hedwigia XLI, p. (178), 1902.

Hab. On *Kraunhia floribunda* Taub. var. *typica* Mak. (*Fuji*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Ikku-mura (T. Yoshinaga).

98. **Ochropsora Nambuana** (P. Henn.) Dietel in Ann. Myc. VI, p. 228, 1908. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 659, 1930).

Syn. *Coleosporium Nambuana* Hennings in Hedwigia XL, p. (25),

1901.

Hab. On *Elaeagnus umbellata* Thunb. (*Aki-gumi*). Prov. Tosa:- Noichi-mura (T. Yoshinaga); Tôchi-mura (T. Yoshinaga).

Xenostele Sydow, 1920.

99. **Xenostele Litseae** (Diet. et P. Henn.) Sydow in Ann. Myc. XVIII, p. 178, 1920.

Syn. *Aecidium Litseae* Patouillard in Bull. Herb. Boiss. no. 1, p. 302, 1893.

Puccinia Litseae Dietel et Hennings in Hennings in Hedwigia XLI, p. (19), 1902. (Dietel in Ann. Myc. VI, p. 225, 1908; Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (33), 1904; XXV, p. (489), 1911; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Hab. On *Tetradenia glauca* Matsum. (*Litsea glauca* Sieb.) (*Shiro-damo*). Prov. Tosa:- Ishitate-hachiman (T. Yoshinaga); Muroto-saki (S. Kusano); Ogawa-mura (T. Yoshinaga, *type!*).

100. **Xenostele Nakanoi** (Kusano et Yoshinaga) Hiratsuka, f. et Yoshinaga, nov. comb.

Syn. *Puccinia Nakanoi* Kusano et Yoshinaga in Bot. Mag. Tokyo, XXV, p. (489), 1911 (*nomen nudum*). (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Aecidiis hypophyllis, gregariis, subepidermalibus, minutis, rotundatis, 0.12~0.2 mm latis; peridiis firmis, cellulis minutis, polygonalibus, 18~30 × 12~22 μ , pariete interiore denseque verruculoso, subhyalino.

Soris teleutosporiferis hypophyllis, sparsis, deinde ad aecidiorum evolutis, tandem nudis, rotundatis, 1~5 mm diam., pulvinatis, brunneis; teleutosporis crasse tunicatis ellipsoideis vel oblongis, medio non vel vix constrictis, levibus, castaneo-brunneis, 45~60 × 20~27 μ , episporio 2~3 μ , apice parum incrassatis; teleutosporis tenuiter tunicatis oblongis vel subfusoides, saepe utrinque attenuatis, medio non vel vix constrictis, levibus, pallide flavidis, 50~65 × 18~24 μ , episporio 1~1.5 μ crasso, rarius apice parum incrassatis; pedicello hyalino vel subhyalino, cylindrico, longissimo.

Hab. On *Tetradenia foliosa* Nees. (*Litsea aciculata* Bl.; *Neolitsea aciculata* Koidz.) (*Inu-gashi*). Prov. Tosa:- Mt. Yokogura (Jan., 1906, K. Nakano, *type!*; June 27, 1926, T. Yoshinaga); Muroto-saki (Jan.,

1907, S. Kusano & T. Yoshinaga); Kakoyama (Ôtsu-mura) (Oct. 23, 1910, T. Yoshinaga); Shôwa-mura (May 5, 1934, T. Yoshinaga).

Miyagia Miyabe, 1913.

101. **Miyagia Anaphalidis** Miyabe in Sydow in Ann. Myc. XI, p. 107 & fig. 5, 1913.

Hab. On *Anaphalis margaritacea* Benth. et Hook. f. var. *japonica* Mak. (*Hosoba-no-yamahahako*). Prov. Tosa:- Kohagemori (T. Yoshinaga).

On *Anaphalis yedoensis* Maxim. (*Kawara-hahako*). Prov. Tosa:- Ma-enohama-mura (T. Yoshinaga).

Rostrupia Lagerheim, 1889.

102. **Rostrupia Dioscoreae** (Kom.) Sydow in Saccardo, Syll. Fung. XVI, p. 315, 1902. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 648, 1930).

Syn. *Uredo Dioscoreae-quinquelobae* Hennings in Hedwigia XLII, p. (108), 1903. (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (35), 1904).

Puccinia (Rostrupia) Dioscoreae Komarov in Jaczewski, Komarov & Tranzschel, Fung. Ross. exs. no. 269, 1899. (Dietel in Ann. Myc. VIII, p. 310, 1910).

Hab. On *Dioscorea quinqueloba* Thunb. (*Kaede-dokoro*). Prov. Tosa:- Hane-mura (K. Ogawa); Kônai-zaka (T. Yoshinaga, *type* of *Uredo Dioscoreae-quinquelobae* Hennings!); Ino-machi (T. Yoshinaga).

Uromyces Link, 1816.

103. **Uromyces Saururi** Hennings in Hedwigia XLI, p. (19), 1902. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 255, & pl. VIII, fig. 23, 1922; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

Hab. On *Saururus Loureiri* Decne. (*Hangeshô*). Prov. Tosa:- Numayamazeki (T. Yoshinaga, *type!*); Aki-machi (T. Yoshinaga); Mitani-goe (M. Kamimura).

104. **Uromyces Polygoni** (Pers.) Fuckel, Symb. Myc. p. 64, 1869. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 253, 1922; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (219), 1904; XIX, p. (36), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo,

XLIV, p. 631, 1930).

Syn. *Puccinia Polygoni* Persoon in Neues Mag. Bot. I, p. 119, 1794; Disp. Meth. Fung. p. 39, 1797.

Hab. On *Polygonum aviculare* L. (*Michiyanagi*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Kôchi-shi (T. Yoshinaga). Prov. Awa:- Anabuki-machi (T. Yoshinaga); Hanoura-machi (T. Yoshinaga). Prov. Iyo:- Dôgo (K. Okudaira).

105. **Uromyces caryophyllinus** (Schrank) Winter in Pilze Deutschl. I, p. 149, 1881. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 250, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1920).

Syn. *Lycoperdon caryophyllum* Schrank, Baier. Fl. II, p. 668, 1789.

Hab. On *Dianthus chinensis* L. (*Sekichiku*) (*Cult.*). Prov. Tosa:- Susaki-machi (M. Kamimura).

On *Dianthus superbus* L. (*Kawara-nadeshiko*). Prov. Tosa:- Ôsaka-yama (T. Yoshinaga). Prov. Iyo:- Unzen-gun (K. Okudaira); Matsuyama-shi (K. Okudaira).

106. **Uromyces appendiculatus** (Pers.) Link, Observ. Myc. II, p. 28, 1816. (Hennings in Engl. Bot. Jahrb. XXXI, p. 728, 1902; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 228, 1922, p.p.; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 628, 1930, p.p.).

Syn. *Uredo appendiculata* Persoon in Ann. Bot. Usteri, XV, p. 16, 1795.

Uromyces Fatouae Hennings in Hedwigia XLI, p. (18), 1902. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902).

Hab. On *Phaseolus pendulus* Mak. (*Phaseolus radiatus* L. var. *flexuosus* Matsum.) (*Tsuru-adzuki*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga). Prov. Awa:- Anabuki-machi (T. Yoshinaga).

On *Phaseolus radiatus* L. var. *aurea* Prain (*Adzuki*) (*Cult.*). Prov. Iyo:- Kumanchô-mura (K. Okudaira).

On *Phaseolus vulgaris* L. (*Ingen-mame*) (*Cult.*). Prov. Iyo:- Sugô-mura (K. Okudaira); Matsuyama-shi (K. Okudaira); Tamatsu-mura (K. Kimura). Prov. Awa:- Sanakôchi-mura (T. Yoshinaga). Prov. Tosa:- Ônomi-mura (A. Ôyama).

107. **Uromyces Vignae** Barclay in Jour. Asiatic Soc. Bengal,

LX, pt. 2, p. 211, 1891.

Syn. *Uromyces appendiculatus* (not Link) (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 228, 1922, p. p.; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 628, 1930, p. p.).

Hab. On *Vigna sesquipedalis* A. I. Pieters (*Hata-sasage*) (*Cult.*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Arakura-zaka (T. Yoshinaga).

108. **Uromyces Ervi** (Opiz) Westendorp in Bull. Acad. Roy. Sci. de Belg. XXI, pt. 2, p. 246 & fig. 3, 1854. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 241 & pl. VIII, fig. 12, 1922; Hiratsuka, f. in Jap. Jour. Bot. VI, p. 372~373, 1933; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 628, 1930).

Syn. *Aecidium Ervi* Wallroth, Fl. Crypt. Germ. II, p. 247, 1833. *Puccinia Ervi* Opiz in Seznam., p. 139, 1852.

Uromyces Ervi Plowright (Dietel in Engl. Bot. Jahrb. XXXVII, p. 98, 1905).

Uromyces Fabae (not de Bary) (Hennings in Engl. Bot. Jahrb. XXXIV, p. 594, 1905, p. p.; XXXVII, p. 157, 1905, p. p.).

Hab. On *Vicia hirsuta* Koch (*Suzume-no-endô*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Sakawa-machi (T. Yoshinaga); Nagaoka-mura (M. Kamimura). Prov. Sanuki:- Hiketa-machi (T. Yoshinaga).

On *Vicia sativa* L. (*Yahazu-endô*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Kôchi-shi (T. Yoshinaga); Sakawa-machi (T. Yoshinaga); Susaki-machi (M. Kamimura). Prov. Sanuki:- Hiketa-machi (T. Yoshinaga). Prov. Awa:- Ikeda-machi (T. Yoshinaga).

On *Vicia tetrasperma* Moench. (*Kasuma-gusa*). Prov. Tosa:- Ioki-mura (T. Yoshinaga); Sakawa-machi (T. Yoshinaga). Prov. Awa:- Ikeda-machi (T. Yoshinaga). Prov. Sanuki:- Hiketa-machi (T. Yoshinaga).

109. **Uromyces Fabae** (Pers.) de Bary in Ann. Sci. Nat. 4. Sér. XX, p. 72, 1863. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 594, 1905, p. p.; XXXVII, p. 157, 1905, p. p.; Hiratsuka, f. in Jap. Jour. Bot. VI, p. 365~371, 1933; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 237, 1922; Yoshinaga in Bot. Mag. Tokyo, XVII, p. (36), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 628, 1930).

Syn. *Uredo Fabae* Persoon in Neues Mag. Bot. I, p. 93, 1794.

Uromyces Fabae Schröter (Dietel in Engl. Bot. Jahrb. XXXVII, p. 98, 1905).

Uromyces Orobi (not Winter) (Dietel in Engl. Bot. Jahrb. XXXVII, p. 98, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905).

Uromyces Yoshinagai Hennings in Hedwigia XL, p. (124), 1901. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902).

Hab. On *Lathyrus maritimus* Bigel. (*Hama-endô*). Prov. Tosa:- U-rado-mura (T. Yoshinaga); Ioki-mura (T. Yoshinaga).

On *Pisum sativum* L. (*Endô*)(*Cult.*). Prov. Tosa:- Mikadzuki-mura (T. Yoshinaga); Kamo-mura (T. Yoshinaga, type of *Uromyces Yoshinagai* Hennings!); Nagaoka-mura (H. Asuyama). Prov. Iyo:- Tachima-mura (K. Kimura).

On *Vicia Faba* L. (*Sora-mame*)(*Cult.*). Prov. Tosa:- Kawakita-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga); Kusaka-mura (T. Yoshinaga); Nagaoka-mura (H. Asuyama). Prov. Iyo:- Dôgo (K. Okudaira); Yoshida-machi (K. Kimura). Prov. Awa:- Ikeda-machi (T. Yoshinaga). Prov. Sanuki:- Nagao-machi (T. Yoshinaga).

110. **Uromyces Orobi** Léveillé in Ann. Sci. Nat. 3. Sér. VIII, p. 371 & 376, 1847. (Hiratsuka, f. in Jap. Jour. Bot. VI, p. 371, 1933; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 242, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1930).

Syn. *Uromyces Fabae* (not Schröter) (Dietel in Ann. Myc. VIII, p. 304, 1910).

Hab. On *Vicia unijuga* Al. Br. (*Nanten-hagi*). Prov. Tosa:- Okô-yama (T. Yoshinaga).

111. **Uromyces Genistae-tinctoriae** (Pers.) Winter in Pilze Deutschl. I, p. 149, 1881. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 221, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 629, 1930).

Syn. *Uredo appendiculata* var. *Genistae-tinctoriae* Persoon, Syn. Fung. p. 222, 1801.

Uromyces caraganicola Hennings in Hedwigia XL, p. (124), 1901. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902).

Hab. On *Caragana Chamlagu* Lam. (*Mure-suzume*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga, type of *Uromyces caraganicola* Hennings!); Aki-machi (T. Yoshinaga).

112. **Uromyces Itoanus** Hiratsuka, f. in Hiratsuka, f. & Tobinaga

naga in Ann. Phytopath. Soc. Japan, IV, p. 161, 1935.

Syn. *Uromyces Lespedezae* (not Peck) (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902).

Uromyces Lespedezae-procumbentis (not Curtis) (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 224, 1922, p. p.; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 629, 1930, p. p.).

Hab. On *Microlespedeza striata* Mak. (*Lespedeza striata* Hook. et Arn.) (*Yahazu-sô*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Akatsuchi-tôge (T. Yoshinaga). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga).

113. **Uromyces Lespedezae-procumbentis** (Schw.) Curtis in Geol. Survey N. Carol. III, p. 123, 1867. (Hiratsuka, f. & Tobinaga in Ann. Phytopath. Soc. Japan, IV, p. 158, 1935; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 224, 1922, p. p.; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 629, 1930, p. p.).

Syn. *Puccinia Lespedezae-procumbentis* Schweinitz in Schr. Nat. Ges. I, p. 73, 1822.

Uromyces Lespedezae Peck in Coult. in Bot. Bull. (Bot. Gaz.), I, p. 20, 1878. (Dietel in Ann. Myc. VI, p. 223, 1908; Hennings in Engl. Bot. Jahrb. XXXIV, p. 594, 1905; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902).

Hab. On *Lespedeza bicolor* Turcz. var. *japonica* Nakai (*Yama-hagi*). Prov. Tosa:- Ochi-machi (T. Yoshinaga); Ônomi-mura (A. Ôyama); Aki-machi (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura); Mikame-mura (K. Kimura); Koshiore-yama (K. Okudaira). Prov. Awa:- Orono-mura (T. Yoshinaga). Prov. Sanuki:- Umpen-san (T. Yoshinaga).

On *Lespedeza Buergeri* Miq. (*Ki-hagi*). Prov. Tosa:- Akatsuchi-tôge (T. Yoshinaga); Nakamura-machi (T. Morimoto).

On *Lespedeza cuneata* G. Don (*Lespedeza juncea* Pers. var. *sericea* Maxim.) (*Medo-hagi*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Shimoda-machi (T. Morimoto); Ônomi-mura (A. Ôyama); Yasu-mura (T. Yoshinaga). Prov. Iyo:- Sekigawa-mura (T. Yoshinaga).

On *Lespedeza cyrtobotrya* Miq. (*Maruba-hagi*). Prov. Tosa:- Jûroku-mura (T. Yoshinaga).

On *Lespedeza pilosa* Sieb. et Zucc. (*Neko-hagi*). Prov. Tosa:- Kamoda-mura (T. Yoshinaga). Prov. Iyo:- Sekigawa-mura (T. Yoshinaga).

114. **Uromyces Loti** Blytt in Forhandl. Viden.-Selsk. Christ., (1896), no. p. 37, 1896. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 243, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 629, 1930).

Syn. *Uromyces striatus* (not Schröter) (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. 219, 1904).

Hab. On *Lotus corniculatus* L. var. *japonica* Rgl. (*Miyako-gusa*). Prov. Tosa:- Noichi-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura).

115. **Uromyces amurensis** Komarov in Jaczewski, Komarov & Tranzschel, Fung. Ross. exs. nos. 157 & 158, 1898. (Hiratsuka, f. in Jour. Jap. Bot. XI, p. 332, 1935; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 226, 1922; Kusano in Bot. Mag. Tokyo, XIX, p. 84, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930).

Syn. *Uromyces oedipus* Dietel in Engl. Bot. Jahrb. XXXIV, p. 583, 1905. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905).

Uromyces Sophorae-japonicae (not Dietel) (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904).

Hab. On *Maackia amurensis* Rupr. et Maxim. var. *Buergeri* C. K. Schn. (*Inu-enju*). Prov. Tosa:- Kamoda-mura (T. Yoshinaga, type of *Uromyces oedipus* Dietel!). Prov. Iyo:- Odamiyama (T. Yoshinaga). Prov. Awa:- Naka-kitô-mura (T. Yoshinaga).

On *Maackia Tashiroi* Mak. (*Shima-enju*). Prov. Tosa:- Muroto-saki (T. Yoshinaga; M. Kamimura).

116. **Uromyces shikokianus** Kusano in Bot. Mag. Tokyo, XIX, p. 83 & text-fig. 1, 1905. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 98, 1905; Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 231 & pl. VII, fig. 18, 1922; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1930).

Hab. On *Cladrastis shikokiana* Mak. (*Sophora shikokiana* Mak.) (*Yukunoki*). Prov. Tosa:- Mt. Yanaze (T. Yoshinaga, type!); Tomioka-mura (T. Yoshinaga); Makinoyama-mura (T. Yoshinaga). Prov. Awa:- Sasa-tôge (T. Yoshinaga).

117. **Uromyces Sophorae-flavescentis** Kusano in Bot. Mag. To-

kyo, XVIII, p. 4 & text-fig. 3, 1904.

Hab. On *Sophora angustifolia* Sieb. et Zucc. (*Sophora flavescens* Ait.) (*Kurara*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

118. **Uromyces sphaerocarpus** Sydow in Ann. Myc. II, p. 349, 1904. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 223 & pl. VII, fig. 9, 1922; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (219), 1904; XIX, p. (36), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1930).

Hab. On *Indigofera pseudo-tinctoria* Matsum. (*Komatsunagi*). Prov. Tosa:- Ioki-mura (T. Yoshinaga, type!); Kôchi-shi (T. Yoshinaga). Prov. Awa:- Ikeda-machi (T. Yoshinaga); Kamibunkamiyama-mura (T. Yoshinaga). Prov. Iyo:- Sekigawa-mura (T. Yoshinaga). Prov. Sanuki:- Nio-machi (T. Yoshinaga).

119. **Uromyces Hyperici** (Spreng.) Curtis in Geol. Survey N. Carol. III, p. 123, 1867.

Syn. *Uredo Hyperici* Sprengel, Syst. Veg. IV, p. 572, 1827.

Uromyces Hyperici-frondosi Arthur in Bull. Minnesota Acad. Nat. Sci. II, no. 2, p. 15, 1883. (Dietel in Ann. Myc. XX, p. 293, 1922; Itô in Bot. Mag. Tokyo, XL, p. 277, 1926; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930).

Hab. On *Hypericum japonicum* Thunb. var. *Thunbergii* Kell. (*Hime-otogiri*). Prov. Tosa:- Usa-machi (T. Yoshinaga); Kamoda-mura (T. Yoshinaga).

120. **Uromyces Mercurialis** Hennings in Hedwigia XLI, p. (62), 1902; Itô in Ann. Myc. XX, p. 83, 1922; Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 247 & pl. VIII, fig. 16, 1922. (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1930).

Syn. *Aecidium Marci* (not Bubák) (Dietel in Ann. Myc. VI, p. 229, 1908; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 662, 1930).

Exs. Sydow, Fung. exot. exs. no. 490.

Hab. On *Mercurialis leiocarpa* Sieb. et Zucc. (*Yama-ai*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga, type!); Arakawa (Akatsukamura) (T. Yoshinaga). Prov. Iyo:- Iwaya-yama (K. Okudaira); Iradzu-yama (T. Yoshinaga); Odamiyama (T. Yoshinaga).

121. **Uromyces proeminens** (DC.) Lévillé in Ann. Sci. Nat. 3. Sér. VIII, p. 371 & 375, 1847. (Itô in Jour. Agric. Coll. Hokkaidô Imp. Univ. XI, p. 245 & pl. VIII, fig. 15, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 630, 1930).

Syn. *Uredo proeminens* de Candolle, Fl. franç. II, p. 235, 1805.

Uromyces Euphorbiae Cooke et Peck in Peck in Ann. Rept. N. Y. State Mus. XXV, p. 90, 1873. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905).

Hab. On *Euphorbia humifusa* Willd. (*Nishiki-sô*). Prov. Tosa:- Aki-machi (T. Yoshinaga).

122. **Uromyces Limonii** (DC.) Lévillé, Dict. d'Hist. Nat. Art. Ured. p. 19, 1840; Cooke, Mier. Fung. p. 211, 1865. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 218, 1922).

Syn. *Puccinia Limonii* de Candolle, Fl. franç. II, p. 595, 1805.

Hab. On *Statice japonica* Sieb. et Zucc. (*Hamasaji*). Prov. Iyo:- Awai-mura (K. Okudaira).

123. **Uromyces Galii** Dietel in Ann. Myc. V, p. 71, 1907. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 217, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930).

Hab. On *Galium Aparine* L. (*Yaemugura*). Prov. Tosa:- Aki-machi (T. Yoshinaga, *type!*).

124. **Uromyces Rudbeckiae** Arthur et Holway in Arthur in Bull. Iowa Agric. Coll. Dept. Bot. (1884), p. 154, 1884. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 186, 1935; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 215, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930).

Syn. *Uromyces Rudbeckiae* Arthur et Holway f. *Virgaureae* Hennings in Hedwigia XL, p. (125), 1901. (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902).

Uromyces sakavensis Hennings in Hedwigia XLII, p. (107), 1903. (Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (35), 1904).

Hab. On *Solidago Virgaurea* L. (*Akinokirinsô*). Prov. Tosa:- Saka-wa-machi (T. Yoshinaga, *type of Uromyces sakavensis* Hennings!); Kuroiwa-mura (T. Yoshinaga); Shôda (Kuroiwa-mura) (T. Yoshinaga). Prov. Iyo:- Mt. Ishidzuchi (K. Okudaira).

125. **Uromyces Wedeliae** Hennings in Hedwigia XLIII, p. 150, 1904; Sydow, Monogr. Ured. II, p. 12 & pl. I, fig. 14. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 594, 1905; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 216 & pl. VII, fig. 4, 1922; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (36), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 627, 1930).

Hab. On *Wedelia prostrata* Hemsl. (*Hama-guruma*). Prov. Tosa:- Ioki-mura (T. Yoshinaga, *type!*); Katsura-hama (Urado-mura) (T. Yoshinaga); Nagahama (M. Kamimura).

126. **Uromyces coronatus** Miyabe et Nishida in Dietel in Bot. Centralbl. CV, p. 495, 1905; Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 183 & pl. X, fig. 2, 1909. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 272, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 632, 1930).

Syn. *Uromyces coronatus* Yoshinaga in Dietel in Ann. Myc. V, p. 70, 1907.

Ontoteliium coronatum Sydow in Ann. Myc. XIX, p. 174, 1921.

Exs. Sydow, Fung. exot. exs. no. 4.

Hab. On *Zizania aquatica* L. (*Makomo*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga, *type of Uromyces coronatus* Yoshinaga!).

127. **Uromyces Halstedii** de Toni in Saccardo, Syll. Fung. VII, p. 557, 1888. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 269, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 632, 1930).

Syn. *Uromyces ovalis* Dietel in Engl. Bot. Jahrb. XXXVII, p. 97, 1905. (Dietel in Ann. Myc. VIII, p. 304, 1910).

Hab. On *Leersia oryzoides* Sw. var. *japonica* Hack. (*Sayanuka-gusa*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

128. **Uromyces Alopecuri** Seymour in Proc. Boston Soc. Nat. Hist. XXIV, p. 186, 1889. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 267, 1922; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (35), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 632, 1930).

Syn. *Uromyces Alopecuri* Seymour var. *japonica* Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 184 & pl. X, fig. 3, 1909.

Hab. On *Alopecurus fulvus* L. (*Suzumenotteppô*). Prov. Tosa:- Shimoji-mura (T. Yoshinaga). Prov. Iyo:- Sugô-mura (K. Okudaira).

Prov. Sanuki:- Hiketa-machi (T. Yoshinaga).

On *Alopecurus japonicus* Steud. (*Setogaya*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga).

129. **Uromyces Eriochloae** Sydow et Butler in Ann. Myc. V, p. 492, 1907. (Dietel in Ann. Myc. VIII, p. 304, 1910; Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 269, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 632, 1930).

Hab. On *Eriochloa villosa* Kunth. (*Naruko-bie*). Prov. Tosa:- Kônotani-mura (T. Yoshinaga).

130. **Uromyces linearis** Berkeley et Broome in Jour. Linn. Soc. Bot. XIV, p. 92, 1875. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tôkyo, XLIV, p. 632, 1930).

Hab. On *Panicum repens* L. (*Hai-kibi*). Prov. Tosa:- Irino-mura (T. Yoshinaga).

131. **Uromyces Setariae-italicae** Yoshino in Bot. Mag. Tokyo, XX, p. (247), 1906; Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 185 & pl. X, fig. 4, 1909. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 271, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 632, 1930).

Syn. *Uredo Setariae-italicae* Dietel in Engl. Bot. Jahrb. XXXII, p. 632, 1903. (Dietel in Ann. Myc. VIII, p. 314, 1910).

Hab. On *Chaetochloa italica* Scribn. var. *germanica* Scribn. (*Setaria italica* Beauv. var. *germanica* Trin.) (*Awa*) (*Cult.*). Prov. Tosa:- Niidama (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

On *Chaetochloa lutescens* Stuntz. var. *genuina* Honda (*Setaria glauca* Beauv.) (*Kin-enokoro*). Prov. Tosa:- Takasu-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

132. **Uromyces tenuicutis** Mc Alpine, The rusts of Australia, p. 87 & pl. XVI, fig. 133, 1906. (Dietel in Ann. Myc. VI, p. 223, 1908; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Hab. On *Sporobolus indicus* R. Br. (*Nezumino-o*). Prov. Tosa:- Misato-mura (T. Yoshinaga).

133. **Uromyces Commelinae** Cooke in Transact. Roy. Soc. Edinb. XXXI, p. 342, 1888. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 263, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag.

Tokyo, XLIV, p. 631, 1930).

Syn. *Uromyces tosenensis* Hennings in Hedwigia XLII, p. (107), 1903. (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (36), 1904).

Hab. On *Commelina communis* L. (*Tsuyu-kusa*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga, type of *Uromyces tosenensis* Hennings!). Prov. Iyo:- Yoshida-machi (K. Kimura).

134. **Uromyces durus** Dietel in Ann. Myc. V, p. 70, 1907. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 258 & pl. VIII, fig. 25, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

Syn. *Uromyces ambiguus* (not DC.) (Dietel in Hedwigia XLI, p. (177), 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (7), 1902).

Puccinia Allii-japonici (not Dietel) (Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905).

Hab. On *Allium nipponicum* Franch. et Sav. (*Nobiru*). Prov. Tosa:- Aki-machi (T. Yoshinaga, type!); Kamoda-mura (T. Yoshinaga); Sakawa-machi (T. Yoshinaga); Nagaoka-mura (M. Kamimura). Prov. Awa:- Ikeda-machi (T. Yoshinaga); Ashiro-mura (T. Yoshinaga).

135. **Uromyces Erythronii** (DC.) Passarini, Comm. Soc. Critt. Ital. II, p. 452, 1867. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 259 & pl. IX, fig. 2, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

Syn. *Uredo Erythronii* de Candolle, Fl. franç. VI, p. 67, 1815.

Uromyces Tulipae Dietel in Engl. Bot. Jahrb. XXVIII, p. 282, 1901. (Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (37), 1904).

Hab. On *Tulipa edulis* Bak. (*Amana*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Susaki-machi (M. Kamimura); Prov. Awa:- Shishikui (T. Yoshinaga).

136. **Uromyces Holwayi** Lagerheim in Hedwigia XXVIII, p. 108, 1889. (Itô in Jour. Coll. Agric. Hokkaidô Imp. Univ. XI, p. 261, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

Syn. *Uromyces japonicus* Sydow in Mém. Herb. Boiss. no. 4, p. 3, 1900. (Dietel in Ann. Myc. V, p. 70, 1907).

Hab. On *Lilium Maximowiczii* Rgl. (*Ko-oni-yuri*). Prov. Tosa:- Hishigashigawa-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Ki-

mura).

On *Lilium tigrinum* Gawl. (*Oni-yuri*). Prov. Tosa:- Asakura-mura (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura).

137. **Uromyces Veratri** (DC.) Schröter in Abhandl. Schles. Ges. vaterl. Kult. Abt. Nat. Med. XLVIII (1869~72), p. 10, 1870. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 188, 1935; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 631, 1930).

Syn. *Uredo Veratri* de Candolle in Poir. in Lam., Encycl. Bot. VIII, p. 224, 1808.

Hab. On *Veratrum album* L. var. *grandiflorum* Maxim. (*Veratrum album* L. var. *Lobelianum* Bak. f. *japonica* Bak.) (*Baikeisô*). Prov. Tosa:- Mt. Tebako (T. Yoshinaga). Prov. Iyo:- Omogô-kei (T. Yoshinaga).

Puccinia Persoon, 1797.

138. **Puccinia Thesii-decurrentis** Dietel in Ann. Myc. VI, p. 225, 1908. (Dietel in Ann. Myc. VIII, p. 310, 1910; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 639, 1930).

Syn. *Uredo Thesii-decurrentis* Hennings in Hedwigia XL, p. (125), 1901. (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902).

Hab. On *Thesium chinense* Turcz. (*Kanabikisô*). Prov. Tosa:- Hane-mura (K. Ogawa); Hada-mura (T. Yoshinaga); Sakawa-machi (T. Yoshinaga, type of *Uredo Thesii-decurrentis* Hennings!).

139. **Puccinia Acetosae** Körnicke in Hedwigia XV, p. 184, 1876. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (4), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 639, 1930).

Syn. *Uromyces Acetosae* (not Schröter) (Sydow in Ann. Myc. XII, p. 105, 1914).

Hab. On *Rumex Acetosa* L. (*Suiba*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Kôchi-shi (T. Yoshinaga); Ônomi-mura (A. Ôyama). Prov. Awa:- Orono-mura (T. Yoshinaga). Prov. Sanuki:- Nagao-machi (T. Yoshinaga).

The teleutospores of the present fungus have not yet been collected in our country, as far as the writers know.

140. **Puccinia Bistortae** de Candolle, Fl. franç. VI, p. 61, 1815. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 189, 1935).

Hab. On *Bistorta vulgaris* Hill. (*Polygonum Bistorta* L.) (*Ibuki-torano-o*). Prov. Awa:- Mt. Tsurugi (T. Yoshinaga).

141. **Puccinia Polygoni-amphibii** Persoon, Syn. Fung. p. 227, 1801. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 639, 1930).

Syn. *Puccinia Polygoni* Pers. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 102, 1905; Hennings in Engl. Bot. Jahrb. XXXI, p. 731, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902).

Hab. On *Geranium nepalense* Sw. (*Fûrosô*). Prov. Tosa:- Kami-Nirô-mura (T. Yoshinaga).

On *Persicaria sagittata* H. Gross. var. *Sieboldii* Nakai (*Polygonum sagittatum* L. var. *americanum* Meisn.) (*Aki-no-unagitsukami*). Prov. Tosa:- Hada-mura (T. Yoshinaga).

On *Persicaria Thunbergii* Nakai var. *typica* Miyabe (*Polygonum Thunbergii* Sieb. et Zucc.) (*Mizo-soba*). Prov. Tosa:- Kôchi-shi (T. Yoshinaga); Ananai-mura (T. Yoshinaga); Aki-machi (T. Yoshinaga).

On *Tovara filiformis* Nakai (*Polygonum virginianum* L. var. *filiforme* Nakai) (*Midzu-hiki*). Prov. Tosa:- Ogawa-mura (T. Yoshinaga); Onomi-mura (A. Ôyama).

On *Reynoutria japonica* Houtt. (*Polygonum Reynoutria* Mak.) (*Itadori*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Ônomi-mura (A. Ôyama). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga); Tachima-mura (K. Kimura). Prov. Awa:- Ikeda-machi (T. Yoshinaga). Prov. Sanuki:- Nio-machi (T. Yoshinaga).

142. **Puccinia Solmsii** Hennings in Saccardo, Syll. Fung. XIV, p. 357, 1899. (Dietel in Ann. Myc. XX, p. 293, 1922; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 639, 1930).

Hab. On *Persicaria nipponensis* Nakai (*Polygonum nipponense* Mak.) (*Yanone-gusa*). Prov. Tosa:- Nunoshida-mura (T. Yoshinaga).

143. **Puccinia Arenariae** (Schum.) Winter in Pilze Deutschl. I, p. 167, 1881.

Syn. *Uredo Arenariae* Schumacher, Enum. Pl. Saell. II, p. 232, 1803.

Hab. On *Stellaria diversiflora* Maxim. (*Sawa-hakobe*). Prov. Tosa:- Mt. Shiraga (T. Yoshinaga). *Stellaria diversiflora* Maxim. seems to be a new host plant to the present species.

144. **Puccinia Dianthi-japonici** Hennings in Engl. Bot. Jahrb.

XXXIV, p. 595, 1905. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (33), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Hab. On *Dianthus japonicus* Thunb. (*Fuji-nadeshiko*). Prov. Tosa:- Aki-machi (T. Yoshinaga, *type!*); Saga-mura (T. Yoshinaga).

145. **Puccinia Lychnis-Miqueliana**e Dietel in Ann. Myc. V, p. 73, 1907. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 639, 1930).

Hab. On *Lychnis Miqueliana* Rohr. (*Fushiguro-sennō*). Prov. Tosa:- Makinoyama-mura (T. Yoshinaga).

146. **Puccinia Chrysosplenii** Greville in Engl. Flora, V, p. 367, 1836.

Hab. On *Chrysosplenium macrostemon* Maxim. (*Miyama-nekonomesō*). Prov. Tosa:- Kashiyama (Mori-mura) (E. Inouye). *Chrysosplenium macrostemon* Maxim. seems to be a new host plant to the present species.

147. **Puccinia Ribis-japonici** Hennings in Hedwigia XLI, p. (19), 1902. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 199, 1935).

Hab. On *Ribes japonicum* Maxim. (*Komagatake-suguri*). Prov. Iyo:- Mt. Ishidzuchi (T. Yoshinaga, *type!*).

148. **Puccinia tottoriensis** Hiratsuka, f. in Jour. Jap. Bot. X, p. 221 & text-fig. 7, 1934.

Syn. *Puccinia Chrysosplenii* (not Grev.) (Dietel in Ann. Myc. VIII, p. 310, 1910).

Hab. On *Mitella kiusiana* Mak. (*Tsukushi-charumerusō*). Prov. Iyo:- Iwaya-san (Shinagawa-mura) (T. Yoshinaga).

149. **Puccinia Pruni-Persicae** Hori in Phytopathology, II, p. 144, pl. XIII, figs. 1~3 & pl. XIV, figs. 2, 3, 6~8, 1912.

Hab. On *Prunus Mume* Sieb. et Zucc. (*Ume*) (*Cult.*). Prov. Iyo:- Yoshida-machi (K. Kimura). Prov. Tosa:- Kōchi-shi (T. Yoshinaga).

150. **Puccinia Violae** (Schum.) de Candolle, Fl. franç. VI, p. 62, 1815. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 202, 1935; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Syn. *Uredo Violae* Schumacher, Enum. Pl. Saell. II, p. 233, 1803.

Hab. On *Viola Boissieuana* Mak. (*Hime-miyama-sumire*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga).

On *Viola grypoceras* A. Gray (*Tachitsubo-sumire*). Prov. Awa:- Kitō-mura (T. Yoshinaga).

On *Viola ovato-oblonga* Mak. (*Nagaba-tachitsubo-sumire*). Prov. Tosa:- Osaki-mura (A. Akisawa).

On *Viola mandshurica* W. Beck var. *ciliata* Nakai (*Viola Patrinii* DC, var. *chinensis* Ging.) (*Sumire*). Prov. Tosa:- Urado-mura (T. Yoshinaga).

151. **Puccinia Elaeagni** Yoshinaga in Dietel in Ann. Myc. IV, p. 304, 1906. (Dietel in Ann. Myc. V, p. 74, 1907; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 638, 1930).

Exs. Sydow, Fung. exot. exs. no. 464.

Hab. On *Elaeagnus pungens* Thunb. (*Nawashiro-gumi*). Prov. Tosa:- Kamoda-mura (T. Yoshinaga); Asakura-mura (T. Yoshinaga).

152. **Puccinia Angelicae** (Schum.) Fuckel, Symb. Myc. p. 52, 1870.

Syn. *Uredo Angelicae* Schumacher, Enum. Pl. Saell. II, p. 233, 1803.

Puccinia bullata Schröter in Cohn, Beitr. Biol. Pfl. III, p. 74, 1879.

Hab. On *Peucedanum japonicum* Thunb. (*Botan-bōfū*). Prov. Tosa:- Okinoshima-mura (T. Yoshinaga); Ashizuri-zaki (T. Yoshinaga; M. Ishii).

153. **Puccinia Nanbuana** Hennings in Hedwigia XL, p. (26), 1901. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 197, 1935; Lindroth in Acta Soc. pro Fauna et Flora Fennica, XX, no. 1, p. 94, 1902; T. Miyake in Jour. Sapporo Agric. Coll. II, p. 117, 1906; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930).

Syn. *Puccinia bullata* (not Schröter) (Hennings in Engl. Bot. Jahrb. XXXII, p. 35, 1902; Yoshinaga in Bot. Mag. Tokyo, XV, p. (96), 1901).

Puccinia Angelicae (not Fuckel) (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (33), 1904).

Puccinia Angelicae-edulis T. Miyake in Jour. Sapporo Agric. Coll. II, p. 111 & pl. III, fig. 6, 1906. (Dietel in Ann. Myc. VIII, p. 310,

1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930).

Hab. On *Angelica inaequalis* Maxim. (*Hanabi-zeri*). Prov. Iyo:- Ōnogahara (T. Yoshinaga); Nibukawa-mura (T. Yoshinaga).

On *Angelica kiusiana* Maxim. (*Oni-udo*). Prov. Tosa:- Muroto-saki (T. Yoshinaga).

On *Angelica shikokiana* Mak. (*Inu-tōki*). Prov. Tosa:- Kusugame (T. Yoshinaga); Ochi-machi (T. Yoshino; T. Yoshinaga). Prov. Iyo:- Senzokuyama (K. Okudaira). Prov. Sanuki:- Shōdzu-shima (T. Yoshinaga).

On *Angelica Yoshinagae* Mak. (*Tosa-bōfū*). Prov. Tosa:- Tosayama-mura (T. Yoshinaga).

On *Peucedanum decursivum* Maxim. (*No-dake*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Aki-machi (T. Yoshinaga).

154. **Puccinia Oenanthes** T. Miyake in Jour. Sapporo Agric. Coll. II, p. 106 & pl. III, fig. 3, 1906. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930).

Syn. *Uredo Oenanthes* Dietel in Engl. Bot. Jahrb. XXVIII, p. 290, 1900. (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (6), 1902).

Hab. On *Oenanthe stolonifera* DC. (*Seri*). Prov. Tosa:- Kōchi-shi (T. Yoshinaga). Prov. Sanuki:- Nagao-machi (T. Yoshinaga).

155. **Puccinia Phellopteri** Sydow, Monogr. Ured. I, p. 406, 1903. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 102, 1905; T. Miyake in Jour. Sapporo Agric. Coll. II, p. 120, 1906; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930).

Hab. On *Phellopterus littoralis* Fr. Schm. (*Hama-bōfū*). Prov. Tosa:- Aki-machi (T. Yoshinaga).

156. **Puccinia Saniculae** Greville, Fl. Edinb., p. 431, 1824.

Hab. On *Sanicula europaea* L. (*Uma-no-mitsuba*). Prov. Tosa:- Tosayama-mura (T. Yoshinaga). Prov. Awa:- Koyadaira-mura (T. Yoshinaga).

157. **Puccinia tokyensis** Sydow, Monogr. Ured. I, p. 377, 1902. (T. Miyake in Jour. Sapporo Agric. Coll. II, p. 102, 1906; Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 637, 1930).

Syn. *Uredo Cryptotaeniae* Sydow in Mém. Herb. Boiss. no. 4, p.

4, 1900. (Hennings in Engl. Bot. Jahrb. XXXI, p. 734, 1902).

Hab. On *Cryptotaenia japonica* Hassk. (*Mitsuba-zeri*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Tokano-mura (M. Kamimura). Prov. Iyo:- Yoshida-machi (K. Kimura).

158. **Puccinia Dieteliana** Sydow in Dietel in Hedwigia XXXVII, p. 215, 1898. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (4), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Hab. On *Lysimachia clethroides* Duby (*Oka-torano-o*). Prov. Tosa:- Akatsuchi-tōge (T. Yoshinaga); Hage-mura (M. Kamimura); Kadoya (M. Kamimura); Tokano-mura (M. Kamimura). Prov. Awa:- Kōtsusan (T. Yoshinaga). Prov. Iyo:- Odamiyama (T. Yoshinaga). Prov. Sanuki:- Unpenji-yama (T. Yoshinaga).

159. **Puccinia Convolvuli** (Pers.) Castagne, Observ. Pl. Ured. I, p. 16, 1842. (Dietel in Ann. Myc. V, p. 74, 1907; VI, p. 225, 1908; VIII, p. 310, 1910; Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (4), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Syn. *Uredo Betae Convolvuli* Persoon, Syn. Fung. p. 221, 1801.

Hab. On *Calystegia sepium* R. Br. var. *japonica* Mak. (*Hirugao*). Prov. Tosa:- Nahari-machi (T. Yoshinaga).

On *Calystegia sepium* R. Br. var. *japonica* Mak. f. *major* Mak. (*Ō-hirugao*). Prov. Tosa:- Kameiwa-mura (T. Yoshinaga).

On *Calystegia Soldanella* R. Br. (*Hama-hirugao*). Prov. Tosa:- Tōchi-hama (T. Yoshinaga); Susaki-machi (M. Kamimura); Kadoyahama (T. Yoshinaga). Prov. Sanuki:- Shōnai-mura (T. Yoshinaga).

160. **Puccinia Premnae** Hennings in Hedwigia XLI, p. (62), 1902. (Yoshinaga in Bot. Mag. Tokyo, XVIII, p. (34), 1904; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Hab. On *Premna japonica* Miq. (sub "*Premna microphylla* Turcz.") (*Hama-kusagi*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga, *type!*). Prov. Iyo:- Idzushi-yama (T. Yoshinaga).

161. **Puccinia Glechomatis** de Candolle in Poir. in Lam., Encycl. Bot. VIII, p. 245, 1808. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Hab. On *Nepeta Glechoma* Benth. (*Kakidōshi*). Prov. Tosa:- Kō-

chi-shi (T. Yoshinaga); Kuroiwa-mura (T. Yoshinaga); Tokano-mura (M. Kamimura).

162. **Puccinia Menthae** Persoon, Syn. Fung. p. 227, 1801. (Hennings in Engl. Bot. Jahrb. XXXII, p. 35, 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Hab. On *Mentha arvensis* L. var. *vulgaris* Benth. (*Hakka*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura).

On *Clinopodium chinensis* Kuntze (*Kuruma-bana*). Prov. Tosa:- Jūroku-mura (T. Yoshinaga). Prov. Iyo:- Odamiyama (T. Yoshinaga).

163. **Puccinia nipponica** Dietel in Engl. Bot. Jahrb. XXVIII, p. 284, 1900. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Hab. On *Salvia nipponica* Miq. (*Kotojisō*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

164. **Puccinia Veronicarum** de Candolle, Fl. franç. II, p. 594, 1805. (Hiratsuka, f. in Transact. Tottori Soc. Agric. Sci. III, p. 234, 1931; Mem. Tottori Agric. Coll. III, p. 201, 1935).

Hab. On *Veronica virginica* L. var. *japonica* Nakai (*Kugaisō*). Prov. Iyo:- Mt. Higashi-akaishi (T. Yoshinaga).

165. **Puccinia Elytrariae** Hennings in Hedwigia XXXIV, p. 320, 1895. (Hennings in Engl. Bot. Jahrb. XXXI, p. 730, 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 636, 1930).

Syn. *Puccinia Shiraiana* Syd. in Hedwigia XXXVIII, p. (141), 1899. Exs. Sydow, Ured. exs. no. 1985.

Hab. On *Justicia procumbens* L. (*Kitsunenomago*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga); Shimoda-machi (T. Morimoto); Akimachi (T. Yoshinaga). Prov. Iyo:- Yoshida-machi (K. Kimura); Mikame-machi (K. Kimura).

166. **Puccinia punctata** Link in Ges. Nat. Freunde Berlin Mag. VII, p. 30, 1815.

Hab. On *Galium verum* L. var. *lacteum* Maxim. (*Kawara-matsuba*). Prov. Awa:- Hayashi-machi (T. Yoshinaga).

167. **Puccinia Patriniae** Hennings in Engl. Bot. Jahrb. XXVIII,

p. 261, 1900. (Yoshinaga in Bot. Mag. Tokyo, XIX, p. (34), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Hab. On *Patrinia villosa* Juss. (*Otokoheshi*). Prov. Tosa:- Mt. Yokogura (T. Yoshinaga); Ōnomi-mura (A. Ōyama). Prov. Iyo:- Nibukawa-mura (T. Yoshinaga). Prov. Awa:- Kitō-mura (T. Yoshinaga).

168. **Puccinia Absinthii** (Hedw. f.) de Candolle, Fl. franç. VI, p. 56, 1815. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 633, 1930).

Syn. *Uredo (Puccinia) Absinthii* Hedwig, f. in Poir. in Lam., Encycl. Bot. VIII, p. 245, 1808.

Puccinia Tanacetii (not DC.) (Hennings in Engl. Bot. Jahrb. XXXII, p. 35, 1902; Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901).

Hab. On *Artemisia capillaris* Thunb. (*Kawara-yomogi*). Prov. Tosa:- Arakura-zaka (T. Yoshinaga).

On *Artemisia vulgaris* L. var. *indica* Maxim. (*Yomogi*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

169. **Puccinia ferruginosa** Sydow, Monogr. Ured. I, p. 13 & pl. I, fig. 10, 1902. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 192, 1935).

Hab. On *Artemisia japonica* Thunb. (*Otoko-yomogi*). Prov. Tosa:- Noichi-mura (T. Yoshinaga); Sako-mura (T. Yoshinaga).

On *Artemisia vulgaris* L. var. *indica* Maxim. (*Yomogi*). Prov. Awa:- Sanakōchi-mura (T. Yoshinaga).

170. **Puccinia Carduorum** Jacky in Zeitschr. f. Pflanzenkr. IX, p. 27 & 58, 1899. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Carduus crispus* L. (*Hire-azami*). Prov. Tosa:- Shōgase (T. Yoshinaga). Prov. Iyo:- Somagawa-mura (T. Yoshinaga).

171. **Puccinia Carthami** Corda, Icon. Fung. IV, p. 15 & pl. IV, fig. 52, 1840. (Hennings in Hedwigia XL, p. (125), 1901; Engl. Bot. Jahrb. XXXI, p. 729, 1902; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (4), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Carthamus tinctoria* L. (*Benibana*) (*Cult.*). Prov. Tosa:- Tokano-mura (T. Yoshinaga).

172. **Puccinia Chrysanthemi** Roze in Bull. Soc. Myc. France, XVII, p. 92, 1900. (Dietel in Ann. Myc. VI, p. 227, 1908; Engl. Bot. Jahrb. XXXIV, p. 586, 1905; Hennings in Engl. Bot. Jahrb. XXXIV, p. 595, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (33), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Syn. *Puccinia Chrysanthemi-chinensis* Hennings in Hedwigia XL, p. (26), 1901. (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (4), 1902).

Hab. On *Chrysanthemum shiwogiku* Kitamura (*Chrysanthemum ornatum* Hemsl. f. *incompletum* Nakai, *Ch. Decaisneanum* Matsum. var. *radiatum* Mak. f. *incompletum* Mak.) (*Shio-giku*). Prov. Tosa:- Yasu-mura (T. Yoshinaga).

On *Chrysanthemum sinense* Sab. (*Kiku*) (*Cult.*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Sakawa-machi (T. Yoshinaga). Prov. Awa:- Kamibun-kamiyama-mura (T. Yoshinaga). Prov. Sanuki:- Hagiwara-mura (T. Yoshinaga).

173. **Puccinia Horiana** Hennings in Hedwigia XL, p. (25), 1901. (Dietel in Ann. Myc. V, p. 74, 1907; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Chrysanthemum Makinoi* Matsum. et Nakai (*Ryûnô-giku*). Prov. Tosa:- Asakura-mura (T. Yoshinaga).

On *Chrysanthemum shiwogiku* Kitamura (*Shio-giku*). Prov. Tosa:- Ioki-mura (T. Yoshinaga); Yasu-mura (T. Yoshinaga).

On *Chrysanthemum sinense* Sab. (*Kiku*) (*Cult.*). Prov. Tosa:- Akiyama-mura (T. Yoshinaga).

174. **Puccinia Cirsii** Lasch in Rabenhorst, Fung. eur. no. 89, 1859. (Hennings in Bot. Mag. Tokyo, XV, p. (96), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Cirsium Maackii* Maxim. var. *intermedium* Nakai (*No-azami*). Prov. Tosa:- Takaoka-machi (T. Yoshinaga); Ônomi-mura (A. Ôyama).

175. **Puccinia Cirsii-maritimi** Dietel in Ann. Myc. XX, p. 293, 1922. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Cirsium maritimum* Mak. (*Hama-azami*). Prov. Tosa:- Ioki-mura (T. Yoshinaga, *type!*); Ônogô-mura (T. Yoshinaga).

176. **Puccinia Nishidana** Hennings in Hedwigia XL, p. (26),

1901. (Dietel in Ann. Myc. VI, p. 226, 1908; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Hab. On *Cirsium spicatum* Matsum. (*Yama-azami*). Prov. Tosa:- Akatsuchi-tôge (T. Yoshinaga); Kagami-mura (T. Yoshinaga).

177. **Puccinia Hieracii** (Schum.) H. Martius, Prodr. Fl. Mosq., II, Ed., p. 226, 1817. (Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 193, 1935).

Syn. *Uredo Hieracii* Schumacher, Enum. Pl. Saell. II, p. 232, 1803.

Puccinia Picridis Hazslinszky in Math. Term. Közlem. Ung. Wiss. Akad. XIV, p. 81, 1877. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 103, 1905; Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Hab. On *Picris hieracioides* L. var. *japonica* Rgl. (*Kôzorina*). Prov. Tosa:- Kitagawa-mura (T. Yoshinaga).

178. **Puccinia Crepidis-japonicae** Dietel in Ann. Myc. VI, p. 226, 1908. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Crepis japonica* Benth. (*Oni-tabirako*). Prov. Tosa:- Aki-machi (T. Yoshinaga, *type!*). Prov. Iyo:- Sekigawa-mura (T. Yoshinaga).

179. **Puccinia Lapsanae** (Cooke) Fuckel, Symb. Myc. p. 53, 1870. (Dietel in Engl. Bot. Jahrb. XXXIV, p. 586, 1905; Yoshinaga in Bot. Mag. Tokyo, XIX, p. (33), 1905; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Syn. *Trichobasis Lapsanae* Cooke, Micromyc. Fung. ed. IV, p. 224, 1865.

Hab. On *Lapsana humilis* Mak. (*Lapsana parviflora* A. Gray) (*Yabutabirako*). Prov. Tosa:- Kôchi-shi (K. Nakano).

180. **Puccinia minussensis** Thümen in Bull. Soc. Imp. Nat. Moscou, LIII, p. 214, 1878.

Syn. *Puccinia Lactucae* (not Dietel) (Hennings in Hedwigia XL, p. (125), 1901; Engl. Bot. Jahrb. XXXI, p. 729, 1902, p. p., XXXIV, p. 158, 1906).

Puccinia Prenanthis (not Persoon) (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902).

Puccinia lactucicola Miura in Sydow in Ann. Myc. XI, p. 96, 1913.

(Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Hab. On *Lactuca laciniata* Mak. (*Akinogeshi*). Prov. Tosa:- Asakura-mura (T. Yoshinaga); Kôchi-shi (T. Yoshinaga).

181. **Puccinia Lactucae** Dietel in Engl. Bot. Jahrb. XXVIII, p. 285, 1900. (Dietel in Ann. Myc. VIII, p. 310, 1910; Hennings in Engl. Bot. Jahrb. XXXI, p. 729, 1902, p. p.; XXXII, p. 36, 1902; Hiratsuka, f. in Mem. Tottori Agric. Coll. III, p. 194, 1935; Yoshinaga in Bot. Mag. Tokyo, XV, p. (97), 1901; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 634, 1930).

Hab. On *Lactuca dentata* Mak. var. *albiflora* Mak. (*Shirobana-nigana*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

On *Lactuca dentata* Mak. var. *Thunbergiana* Mak. (*Nigana*). Prov. Tosa:- Godai-san (T. Yoshinaga).

182. **Puccinia Lactucae-denticulatae** Dietel in Engl. Bot. Jahrb. XXXVII, p. 103, 1905. (Dietel in Ann. Myc. VI, p. 225, 1908; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Syn. *Puccinia Lactucae* (not Dietel) (Hennings in Engl. Bot. Jahrb. XXXVII, p. 158, 1905).

Hab. On *Lactuca denticulata* Maxim. var. *typica* Maxim. (*Yakushi-sô*). Prov. Tosa:- Aki-machi (T. Yoshinaga); Nakamura-machi (T. Morimoto); Kôchi-shi (T. Yoshinaga); Ônomi-mura (A. Ôyama). Prov. Awa:- Sanakôchi-mura (T. Yoshinaga). Prov. Iyo:- Yoshidamachi (K. Kimura).

183. **Puccinia Lactucae-debilis** Dietel in Ann. Myc. VI, p. 225, 1908. (Dietel in Ann. Myc. VIII, p. 310, 1910; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 635, 1930).

Hab. On *Lactuca debilis* Benth. et Hook. f. (*Jishibari*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga, *type!*).

On *Lactuca stolonifera* Benth. et Hook. f. (*Iwa-nigana*). Prov. Awa:- Higashi-iwayama-mura (T. Yoshinaga).

184. **Puccinia Poae-sudeticae** (West.) Jørstad in Mag. Naturv. LXX, p. 325, 1932.

Syn. *Uredo Poae-sudeticae* Westendorp in Bull. Acad. Belg. (III), IX, p. 650, 1869.

Puccinia Poarum (not Nielsen) (Hennings in Engl. Bot. Jahrb. XXXI, p. 732, 1902; Itô in Jour. Coll. Agric. Tôhoku Imp. Univ.

III, p. 206, 1909; Yoshinaga in Bot. Mag. Tokyo, XVI, p. (5), 1902; Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 647, 1930).

Hab. On *Poa acroleuca* Steud. (*Mizo-ichigotsunagi*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

On *Poa annua* L. (*Suzumeno-katabira*). Prov. Tosa:- Sakawa-machi (T. Yoshinaga).

On *Poa sphondylioides* Trin. (*Kawara-ichigotsunagi*). Prov. Awa:- Anabuki-machi (T. Yoshinaga).

185. **Puccinia Glyceriae** Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 200 & pl. XI, fig. 2, 1909. (Yoshinaga & Hiratsuka, f. in Bot. Mag. Tokyo, XLIV, p. 645, 1930).

Syn. *Puccinia Paniculariae* (not Arthur) (Dietel in Ann. Myc. VI, p. 224, 1908).

Hab. On *Glyceria aquatica* Sm. (*Hiroh-no-dojyôtsunagi*). Prov. Tosa:- Kôchi-shi (S. Kusano; T. Yoshinaga); Kamoda-mura (T. Yoshinaga).

186. **Puccinia glumarum** (Schmidt) Eriksson et Henning in Zeitschr. f. Pflanzenkr. IV, p. 197, 1894. (Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 195, 1909).

Syn. *Uredo glumarum* Schmidt in Nat. Landw. Schädl. Pilze, 1819.

Hab. On *Hordeum sativum* Jess. var. *hexastichon* L. (*Ô-mugi*) (*Cult.*). Prov. Tosa:- Yoshiwara-mura (T. Yoshinaga). Prov. Iyo:- Yoshidamachi (K. Kimura).

On *Triticum sativum* Lam. var. *vulgare* Hack. (*Triticum vulgare* L.) (*Ko-mugi*) (*Cult.*). Prov. Tosa:- Nagaoka-mura (H. Asuyama; S. Tamura). Prov. Iyo:- Kawahara (K. Okudaira); Sugô-mura (K. Okudaira); Matsuyama (H. Mitsuhashi).

187. **Puccinia rubigo-vera** (DC.) Winter in Pilze Deutschl. I, p. 217, 1881.

Syn. *Uredo rubigo-vera* de Candolle, Fl. franç. VI, p. 83, 1815.

Aecidium Clematidis (not DC.) (Yoshinaga in Bot. Mag. Tokyo, XVI, p. (1), 1902).

Puccinia Agropyri Ellis et Everhart in Jour. Myc. VII, p. 131, 1892. (Dietel in Engl. Bot. Jahrb. XXXVII, p. 102, 1905; Hennings in Engl. Bot. Jahrb. XXXI, p. 731, 1901; Itô in Jour. Coll. Agric. Tôhoku Imp. Univ. III, p. 238, 1909; Yoshinaga in Bot. Mag.