HOKKAIDO UNIVERSITY

Title	沖縄島の銹菌
Author(s)	平塚, 直秀
Citation	札幌博物学会会報, 17(1), 16-39
Issue Date	1941-07-31
Doc URL	https://hdl.handle.net/2115/64289
Type	journal article
File Information	Vol.17No.1_003.pdf

Hokkaido University Collection of Scholarly and Academic Papers : HUSCAP

Uredinales of Okinawa Island[1]

(Contributions to the rust-flora of Eastern Asia III)[2]

By

Naohide HIRATSUKA

(平 塚 直 秀)

Introduction

Apparently the first account of a species of rust fungi from Okinawa Island was that of *Phakopsora Ehretiae* by Dr. NAOHARU HIRATSUKA, the present writer's father. In 1900, Dr. HIRATSUKA (*1*) newly described *Phakopsora Ehretiae* HIRATSUKA on leaves of *Ehretia ovalifolia* HASSK. (*Ehretia acuminata* AUCT., *E. thyrsiflora* NAKAI), based upon specimens which were collected by himself and Mr. S. MAEDA (sub "T. MAIDA"), one of his pupils at Shuri-Castle in the island. His paper was entitled, "Notes on some Melampsorae of Japan, III. Japanese species of *Phakopsora*."

Up to 1940 since that time, there have been one species recorded by Mr. T. MIYAKE (*9*), four by Dr. S. ITO (*6*~*8*) and four by the writer (*2*~*5*) from the island chiefly based upon collections made by Dr. HIRATSUKA and the late Mr. T. MIYAGI. These species which had been recorded from this island during the years 1900 to 1940 total eight. They are as follows: *1*) *Phakopsora Ehretiae* HIRATSUKA (*Bubakia Ehretiae* ITO), *2*) *Coleosporium Asterum* (DIET.) SYDOW, *3*) *Poliostelium hyalospora* (SAWADA) MAINS (*Maravalia hyalospora* DIET.), *4*) *Puccinia congesta* BERK. et BR., *5*) *P. lophatheri* (SYD.) HIRATS. f. (*Diorchidium Lophatheri* SYD.), *6*) *P. levigata* HIRATS. f. (*Diorchidium levigatum* SYD. et BUTL.), *7*) *P. Oenanthes-stoloniferae* S. ITO (*P. Oenanthes* T. MIYAKE) and *8*) *Uromyces appendiculatus* (PERS.) LINK.

In 1940, the writer (*4*) recorded seventy-four species of rust fungi from the island based upon a part of collections made by himself and Mr. Y. TAIRA in different localities of the island in January to April of the same year, in his

1) The expenses of the present work have been defrayed from the Scientific Research Expenditure of the Department of Education.

2) Contributions, I—HIRATSUKA, NAOHIDE: A contribution to the knowledge of the rust-flora in the alpine regions of high mountains in Japan. (Mem. Tottori Agric. Coll. III, p. 125~247, 1935). Contributions, II—HIRATSUKA, NAOHIDE & YOSHINAGA, TORAMA: Uredinales of Shikoku. (*Ibid.*, III, p. 249~377, 1935).

papers, "Materials for a rust-flora of Riukiu Islands, I & II."

The materials used by the writer in the present work include besides a number of collections made by the writer in January 1940 and by Mr. TAIRA in February to April of the same year, the specimens collected by Dr. NAOHARU HIRATSUKA, the late Mr. MIYAGI and others. The total number of specimens examined amounts to more than five hundred, amongst which are included 96 species and form-species. The following table shows the number of species, by genera, heretofore known from the island, additions in the present paper and the total.

Table 1. Number of species of Uredinales found in Okinawa Island

Families	Genera	Previously reported	Present additions	Total
Melampsoraceae	*Milesina*	2	0	2
	Hyalopsora	1	0	1
	Pucciniastrum	1	0	1
	Phakopsora	4	1	5
	Coleopucciniella	1	0	1
	Coleosporium	5	2	7
	Skierka	1	0	1
	Ctenoderma	0	1	1
Pucciniaceae	*Kuehneola*	1	0	1
	Hamaspora	1	1	2
	Poliostelium	1	0	1
	Angiopsora	1	0	1
	Pileolaria	1	0	1
	Ravenelia	2	0	2
	Phragmidium	1	1	2
	Uromyces	12	0	12
	Puccinia	31	13	44
	Endophyllum	1	0	1
Uredinales imperfecti	*Aecidium*	5	0	5
	Uredo	4	1	5
Total		76	20	96

As shown in the above table, the rust-flora of Okinawa Island is made up of 20 genera and 96 species, including 10 species of the form-genera, *Aecidium*

and *Uredo*. Among all the genera, the largest is the *Puccinia* having 44 species, next comes the *Uromyces*, then the *Coleosporium*, the *Phakopsora*, the *Aecidium* and the *Uredo*, each having more than 5 species. Among these, the following three species are ascertained to be new to science:—*1*) *Puccinia benokiyamensis* HIRATSUKA, f. on *Ampelygonum umbellatum* MASAMUNE, *2*) *Puccinia Lepturi* HIRATSUKA, f. on *Lepturus repens* R. BR. and *3*) *Puccinia Scirpi-ternatani* HIRATSUKA, f. on *Scirpus ternatanus* REINW.

The writer wishes to acknowledge his indebtedness to Dr. GEORGE B. CUMMINS of Purdue University Agricultural Experiment Station (Lafayette, Indiana, U. S. A.) for his kind advice, and he is also indebted to Mr. YOSHIHISA TAIRA for his faithful assistance on the present work.

Enumeration of species

Melampsoraceae

1. ***Milesina microspora*** HIRATSUKA, f. in Bot. Mag. Tokyo, XLVIII, p. 43, 1934. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 157, 1940).

Hab. On *Cyclosorus acuminatus* NAKAI (*Dryopteris acuminata* NAKAI) (*Hoshida*). Mt. Katsuu-dake (Kunigami-gun) (H.f.,[1] *nos. 223, 227* & *247*); Hanejimura (Kunigami-gun) (Y.T., *no. 423*); Nakijin-mura (Kunigami-gun) (Y.T., *no. 462*).

2. ***Milesina Odontosoriae*** HIRATSUKA, f. in Bot. Mag. Tokyo, XLVIII, p. 46, 1934. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 157, 1940).

Hab. On *Stenoloma chusanum* CHING. (*Odontosoria chinensis* SM. var. *tenuifolia* MAK.) (*Hora-shinobu*). Mt. Onna-dake (Kunigami-gun) (H.f., *no. 83*).

3. ***Hyalopsora Polypodii*** (DIET.) MAGNUS in Ber. Deutsch. Bot. Ges. XIX, p. 582, 1901. (HIRATSUKA, f in Bot. Mag. Tokyo, LIV, p. 373, 1940).

Hab. On *Diplazium oshimense* H. ITO (*Shikeshida*). Motobu-mura (Kunigami-gun) (Y.T., *no. 458*).

4. ***Pucciniastrum Agrimoniae*** (DIET.) TRANZSCHEL in Script. Bot. Hort. Univ. Petropol. IV, p. 301, 1895. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 157, 1940).

Hab. On *Agrimonia pilosa* LEDEB. var. *japonica* NAKAI (*Kinmidzuhiki*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 226*).

---

1) The following abbreviations are used for the names of the collectors most frequently named in the list: H. = NAOHARU HIRATSUKA; H.f. = NAOHIDE HIRATSUKA; Y.T. = YOSHIHISA TAIRA T.M. = TETSUWO MIYAGI.

5. ***Phakopsora Ampelopsidis*** DIETEL et SYDOW in DIETEL in Hedwigia, XXXVII, p. 217, 1898. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 157, 1940).

Hab. On *Ampelopsis brevipedunculata* TRAUTV. var. *Maximowiczi* REHD. (*Ampelopsis heterophylla* SIEB. et ZUCC.) (*No-budô*). Mawashi-mura (Shimajiri-gun) (H.f., *no. 49*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 196*).

6. ***Phakopsora Artemisiae*** HIRATSUKA, f. in Jap. Jour. Bot. III, p. 298, 1927. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 157 & 377, 1940).

Hab. On *Artemisia dubia* WALL. (*Artemisia asiatica* NAKAI) (*Yomogi*). Haneji-mura (Kunigami-gun) (H.f., *no. 209*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 331*).

On *Artemisia japonica* THUNB. (*Otoko-yomogi*). Urazoe-mura (Nakagami-gun) (Y.T., *no. 390*).

On *Chrysanthemum morifolium* RAMAT. (*Kiku*) (*cultivated*). Nawashi (Y.T., *no. 412*); Shuri-shi (Y.T., *no. 355*).

7. ***Phakopsora Ehretiae*** HIRATSUKA in Bot. Mag. Tokyo, XIV, p. 91 & pl. III, figs. 10~13, 1900. (HIRATSUKA, f. in Bot. Mag. Tokyo, L, p. 3, 1936; LIV, p. 158, 1940).

Syn. *Bubakia Ehretiae* ITO in ITO & HOMMA in Transact. Sapporo Nat. Hist. Soc. XV, p. 116, 1938.

Hab. On *Ehretia ovalifolia* HASSK. (*Ehretia thyrsiflora* NAKAI, *E. taiwaniana* NAKAI, *E. acuminata* AUCT.) (*Chisha-no-ki*). Shuri-shi (H., *type!*; S. MAEDA; H.f., *nos. 1, 9, 10, 37 & 38*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 327*); Kanegusuku-mura (Shimajiri-gun) (H.f.,*nos. 194 & 200*).

8. ***Phakopsora formosana*** SYDOW in Ann. Myc. XII, p. 109, 1914.

Hab. On *Glochidion bicolor* HAYATA (*Urajiro-kanko-no-ki*). Mt. Benokiyama (Kunigami-gun) (Y.T., *no. 439*).

On *Glochidion* sp. Shuri-shi (Y.T., *no. 417*).

This species is new to the Riukiu Islands.

9. ***Phakopsora tecta*** JACKSON et HOLWAY in JACKSON in Mycologia, XVIII, p. 148 & pl. XIX, 1926. (HIRATSURA, f. in Bot. Mag. Tokyo, LIV, p. 158, 1940).

Hab. On *Commelina communis* L. (*Tsuyu-kusa*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 253*).

On *Commelina nudiflora* L. (*Shima-tsuyukusa*). Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 317*).

10. ***Coleopucciniella Idei*** HIRATSUKA, f. in Jour. Jap. Bot. XIII, p. 245, 1937. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 158, 1940).

Hab. On *Rhaphiolepis liukiuensis* NAKAI (*Hosoba-sharinbai*). Mt. Onna-dake (Kunigami-gun) (H.f., *no. 85*).

11. ***Coleosporium Asterum*** (DIET.) SYDOW in Ann. Myc. XII, p. 109, 1914. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 158, 1940; ITO, Myc. Fl. Japan, II, no. 2, p 210, 1938).

Hab. On *Kalimeris indica* SCHULTZ-BIP. (*Ko-yomena*). ·Ôsato-mura (Shimajiri-gun) (H.f., *nos. 156* & *160*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *nos. 216* & *259*); Nago-machi (H.f., *nos. 105* & *110*); Onna-mura (Kunigami-gun) (H.f., *no. 80*); Haneji-mura (Kunigami-gun) (H.f., *no. 288*); Kanegusuku-mura (Shimajiri-gun) (H.f., *nos. 187* & *303*); Nawa-shi (H.f., *no. 139*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 330*); Shuri-shi (H.f., *no. 16*).

12. ***Coleosporium Bletiae*** DIETEL in Hedwigia, XXXVII, p. 216, 1898.

Hab. On *Calanthe tripricata* AMES. (*Tsuru-ran*). Mt. Benoki-yama (Kunigami-gun) (Y.T., *no. 433*).

On *Phajus Tankervilliae* BLUME (*Kwakuran*) (*cultivated*). Chatan-mura (Nakagami-gun) (Y.T., *no. 354*).

This species is new to the Riukius.

13. ***Coleosporium Carpesii*** SACCARDO in Riv. Acc. di Padova, XXIV, p. 208, 1874. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 158, 1940).

Hab. On *Carpesium cernuum* L. (*Ko-yabutabako*). Takamine-mura (Shimajiri-gun) (Y.T., *no. 406*); Kochinda-mura (Shimajiri-gun) (Y.T., *no. 421*).

14. ***Coleosporium Clematidis*** BARCLAY in Jour. Asiatic Soc. Bengal, LIX, pt. 2, p. 89, 1890. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 159, 1940).

Hab. On *Clematis grata* WALL. (*Ke-botandzuru*). Onna-mura (Kunigami-gun) (H.f., *no. 62*); Nago-machi (H.f., *no. 107*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 251*); Haneji-mura (Kunigami-gun) (H.f., *nos. 276*, *294* & *295*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 329*); Shuri-shi (H.f., *no. 7*); Takamine-mura (Shimajiri-gun) (H.f.,*no. 182*); Itoman-machi (H.f., *no. 322*).

15. ***Coleosporium Clerodendri*** DIETEL in ENGL. Bot. Jahrb. XXVIII, p. 566, 1899. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 159, 1940).

Hab. On *Clerodendron fragrans* VENT. (*Yaezaki-kusagi*). Takamine-mura (Shimajiri-gun) (Y.T., *no. 404*); Shuri-shi (Y.T., *no. 350*).

On *Clerodendron trichotomum* THUNB. (*Kusagi*). Shuri-shi (H.f., *no.*

42); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 198*); Haneji-mura (Kunigami-gun) (H.f., *nos. 89* & *291*).

16. ***Coleosporium Paederiae*** DIETEL in Ann. Myc. VII, p. 355, 1909. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 159, 1940).

Hab On *Paederia chinensis* HANCE. (*Yaito-bana*). Haneji-mura (Kunigami-gun) (H.f., *no. 274 b*).

17. ***Coleosporium Perillae*** SYDOW in Hedwigia, XXXVIII, p. (141), 1899.

Hab. On *Perilla frutescens* BRIT. var. *crispa* DECNE. form. *purpurea* MAK. (*Shiso*) (*cultivated*). Shuri-shi (H.).

This species is new to the Riukiu Islands.

18. ***Skierka Agallocha*** RACIBORSKI in Bull. Acad. Sci. Cracovie, Cl. Sci. math. et nat. (1909), p. 275, 1909. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 373 & text-figs. 1 (a, b), 1940; HIRATSUKA, f. & TAIRA in Bot. & Zool. VIII, p. 1642, 1940).

Hab. On *Excoecaria Agallocha* L. (*Okinawa-jinkô*). Nawa-shi (Y.T., *no. 398*).

19. ***Ctenoderma Toddaliae*** (PETCH) SYDOW in Ann. Myc. XVII, p. 103, 1919.

Syn. *Uredo Toddaliae* PETCH in SYDOW, Fungi exot. exsicc. no. 69, 1913.

Hab. On *Toddalia asiatica* LAMARCK (*Sarukake-mikan*). Mt. Yozadake (Takamine-mura) (Shimajiri-gun) (Y.T., *no. 401*).

This collection probably represents the secondary uredosori of *Ctenoderma Toddaliae* which was based on pycnia and primary uredosori. This is a new addition to the mycological flora of Japan.

Pucciniaceae

20. ***Kuehneola Callicarpae*** SYDOW in SYDOW & PETRAK in Ann. Myc. XXVI, p. 420, 1928. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 159, 1940).

Hab. On *Callicarpa japonica* THUNB. var. *luxurians* REHD. (*Ô-murasaki-shikibu*). Mt. Onna-dake (Kunigami-gun) (H.f., *nos. 68* & *78*); Nago-machi (H.f., *nos. 236* & *239*); Haneji-mura (Kunigami-gun) (H.f., *no. 270*); Nawa-shi (H.f., *no. 140*; Y.T., *no. 400*); Shuri-shi (H.f., *no. 41*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 197*).

21. ***Hamaspora acutissima*** SYDOW, Monogr. Ured. III, p. 80 & pl. IV, fig. 41, 1912.

Hab. On *Rubus nesiotes* FOCKE (*Kuwanoha-ichigo*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 234*).

This species is new to the Riukius, and *Rubus nesiotes* is a new host plant for the present fungus.

22. ***Hamaspora Rubi-Sieboldii*** (KAWAGOE) DIETEL in Ann. Myc. XX, p. 293, 1922. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 159, 1940).

Hab. On *Rubus Sieboldi* BL. (*Hôroku-ichigo*). Mt. Onna-dake (Kunigami-gun) (H.f., *nos. 76* & *77*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *nos. 214* & *229*); Motobu-mura (Kunigami-gun) (Y.T., *no. 456*); Nakijin-mura (Kunigami-gun) (Y.T., *no. 463*); Mt. Benoki-yama (Kunigami-gun) (Y.T., *no. 434*); Takamine-mura (Shimajiri-gun) (Y.T., *no. 403*).

23. ***Poliostelium hyalospora*** (SAWADA) MAINS in Bull. Torrey Bot. Club, LXVI, p. 175, 1939. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 160, 1940).

Syn. *Maravalia hyalospora* DIETEL in ENGLER-PRANTL, Natürl. Pflanzenfam. II. Aufl. VI, p. 66, 1928. (HIRATSUKA, f. in Jour. Jap. Bot. XIII, p. 251, 1937).

Hab. On *Acacia confusa* MERR. (*Sôshijyu*) (*cultivated*). Onna-mura (Kunigami-gun) (H.f., *no. 66*); Nago-machi (H.f., *no. 101*); Haneji-mura (Kunigami-gun) (H.f., *nos. 100* & *207*); Shuri-shi (H.; H.f., *no. 6*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 57*); Oroku-mura (Shimajiri-gun) (H.f., *no. 118*).

24. ***Angiopsora divina*** SYDOW in Ann. Myc. XXXIV, p. 71, 1936. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 160, 1940).

Hab. On *Leleba multiplex* NAKAI (*Hôrai-chiku*). Haneji-mura (Kunigami-gun) (H.f., *nos. 203* & *204*); Nawa-shi (H.f., *no. 29*); Takamine-mura (Shimajiri-gun) (H.f., *nos. 178* & *179*).

25. ***Pileolaria Shiraiana*** (DIET. et SYD.) ITO in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 273 & pl. IX, fig. 13, 1922. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 160, 1940).

Hab. On *Rhus succedanea* L. (*Haze-no-ki*). Mt. Onna-dake (Kunigami-gun) (H.f., *no. 72*); Onna-mura (Kunigami-gun) (H.f., *no. 70*); Haneji-mura (Kunigami-gun) (H.f., *no. 87*); Nawa-shi (H.f., *no. 129*); Shuri-shi (H.f., *no. 40*).

26. ***Ravenelia Hobsoni*** COOKE in Jour. Roy. Micr. Soc. III, p. 386 & pl. XI, fig. 4, 1880. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 160, 1940).

Hab. On *Pongamia glabra* VENT. (*Kuroyona*). Nawa-shi (H.f., *nos. 132*

& *133*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 301*).

27. ***Ravenelia tephrosiicola*** HIRATSUKA, f. in Jour. Jap. Bot. XIII, p. 249, 1937. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Tephrosia candida* DC. (*cultivated*) Haneji-mura (Kunigami-gun) (H.f., *nos. 212* & *213*).

28. ***Phragmidium griseum*** DIETEL in ENGL. Bot. Jahrb. XXXII, p. 49, 1902.

Hab. On *Rubus rosaefolius* SM. var. *Maximowiczii* FOCKE (*Riukiu-bara-ichigo*). Nago-machi (Kunigami-gun) (Y.T., *no. 453*); Haneji-mura (Kunigami-gun) (H.f., *nos. 99* & *211*).

This species is new to the Riukiu Islands.

29. ***Phragmidium pauciloculare*** (DIET.) SYDOW, Monogr. Ured. III, p. 138 & pl. VI, fig. 60, 1912. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Rubus parvifolius* L. var. *triphyllus* NAKAI (*Nawashiro-ichigo*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 252*); Haneji-mura (Kunigami-gun) (H.f., *no. 296*); Shuri-shi (Y.T., *no. 343*).

30. ***Uromyces appendiculatus*** (PERS.) LINK, Observ. Myc. II, p. 28, 1816. (ITO in Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 230, 1922).

Hab. On *Phaseolus minimus* ROXB. (*Koba-no-tsuruazuki*). Mawashi-mura (Shimajiri-gun) (Y.T., *no. 344*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 311*).

On *Phaseolus vulgaris* L. (*Ingen-mame*) (*cultivated*). Haneji-mura (Kunigami-gun) (T.M.).

Phaseolus minimus is a new host plant for the present species.

31. ***Uromyces Commelinae*** COOKE in Transact. Roy. Soc. Edinb. XXXI, p. 342, 1888. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Commelina communis* L. (*Tsuyukusa*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 233*).

On *Commelina nudiflora* L. (*Shima-tsuyukusa*). Oroku-mura (Shimajiri-gun) (H.f., *no. 125*); Nago-machi (H.f., *no. 220*).

32. ***Uromyces Fabae*** (PERS.) DE BARY in Ann. Sci. Nat. 4. sér. XX, p. 72, 1863. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Vicia Faba* L. (*Sora-mame*) (*cultivated*). Yontanzan-mura (Nakagami-gun) (Y.T., *no. 382*); Ginowan-mura (Nakagami-guu) (Y.T., *no. 367*); Takamine-mura (Shimajiri-gun) (Y.T., *no. 376*).

33. ***Uromyces Lespedezae-procumbentis*** (SCHW.) CURTIS in Geol. Survey N. Car. III, p. 123, 1867. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Lespedeza cuneata* G. DON. (*Medo-hagi*). Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 308*).

34. ***Uromyces linearis*** BERKELEY et BROOME in Jour. Linn. Soc. XIV, p. 92, 1875. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 161, 1940).

Hab. On *Panicum repens* L. (*Hai-kibi*). Onna-mura (Kunigami-gun) (H.f., *no. 64*); Haneji-mura (Kunigami-gun) (H.f., *nos. 278, 281, 289* & *297*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 261*); Shuri-shi (H.f., *no. 18*); Nawa-shi (H.f., *nos. 137* & *142*); Ôsato-mura (Shimajiri-gun) (H.f., *nos. 170* & *171*); Itoman-machi (H.f., *nos. 307* & *321*).

35. ***Uromyces Mucunae*** RABENHORST in Hedwigia, XVII, p. 62, 1878. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Mucuna Hasjoo* ROCK (*Mucuna capitata* WIGHT. et ARN.) (*Hasshô-mame*) (*cultivated*). Oroku-mura (Shimajiri-gun) (H. OKAMOTO, *no. 323*).

36. ***Uromyces pyriformis*** COOKE in PECK in Rept. N. Y. State Mus. XXIX, p. 69, 1878. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Acorus asiaticus* NAKAI (*Shôbu*) (*cultivated*). Nawa-shi (Y.T., *no. 365*); Takamine-mura (Shimajiri-gun) (Y.T., *no. 407*).

37. ***Uromyces Setariae-italicae*** YOSHINO in Bot. Mag. Tokyo, XX, p. 247, 1906. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Setaria lutescens* HUBBARD var. *longispica* HONDA (*Nagabo-no-kin-enokoro*). Haneji-mura (Kunigami-gun) (H.f., *no. 202*).

38. ***Uromyces striatus*** SCHRÖTER in Abhandl. Schles. Ges. vaterl. Kult. XLVIII, p. 11, 1872. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Medicago lupulina* L. (*Kometsubu-umakoyashi*). Shuri-shi (Y.T., *no. 386*).

39. ***Uromyces Tairae*** HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 374 & text-figs. 1 (c & d), 1940.

Hab. On *Messerschmidia argentea* JOHNST. (*Monpa-no-ki*). Mabuni-mura (Shimajiri-gun) (Y.T., *no. 372, type!*).

40. ***Uromyces tenuicutis*** MCALPINE, Rusts of Australia, p. 87 & pl. XVI, fig. 133, 1906. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Sporobolus indicus* R. BR. (*Nezumi-no-wo*). Nawa-shi (H.f., *no. 138*).

41. ***Uromyces Vignae*** BARCLAY in Jour. Asiatic Soc. Bengal, LX, p. 211, 1891. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Dolichos Lablab* L. (*Fuji-mame*) (*cultivated*). Oroku-mura (Shimajiri-gun) (H.f., *nos 120* & *121*).

42. ***Puccinia Absinthii*** (HEDW. f.) de CANDOLLE, Fl. franç. VI, p. 56, 1815. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 375, 1940).

Hab. On *Artemisia dubia* WALL. (*Yomogi*). Haneji-mura (Kunigami-gun) (Y.T., *no. 424*); Chinen-mura (Shimajiri-gun) (H.f., *no. 144*).

On *Artemisia japonica* THUNB. (*Otoko-yomogi*). Haneji-mura (Kunigami-gun) (H.f., *no. 279*).

43. ***Puccinia anomala*** ROSTRUP in THÜMEN in Flora, LXI, p. 92, 1878. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 375, 1940).

Hab. On *Hordeum sativum* JESS. var. *hexastichon* HACK. (*Ô-mugi*) (*cultivated*). Haneji-mura (Kunigami-gun) (Y.T., *no. 428*).

44. ***Puccinia benokiyamensis*** HIRATSUKA, f. nov. spec.

Soris uredosporiferis hypophyllis, sparsis vel laxe aggregatis, minutis, rotundatis, mox nudis, subpulverulentis, pallide brunneis; uredosporis subglobosis, ellipsoideis vel obovatis, laxe echinulatis, flavo-brunneis, 20–27 × 17–22 μ; episporio 1–1.5 μ crasso, poris germinationis 2 in parte basali sporae praeditis; soris teleutosporiferis conformibus, obscure brunneis; teleutosporis ellipsoideo-oblongis, oblongis vel clavatis, apice rotundatis et incrassatis (6–9 μ), medio constrictis, basi rotundatis vel attenuatis, levibus, brunneis, 33–50 × 17–24 μ; pedicello persistenti, crassiusculo, flavo-brunneolo, usque 30 μ longo.

Hab. On *Ampelygonum umbellatum* MASAMUNE (*Tsuru-soba*). Mt. Benokiyama (Kunigami-gun) (April 10 & 11, 1940, Y. TAIRA, *nos. 432, 435* & *436, type!*).

The present species is very much like *Puccinia Fagopyri* BARCL. in having uredospores with two basal germ pores and generally similar teleutospores. But, the teleutospores of this species are somewhat larger and with thicker apex.

45. ***Puccinia Cirsii-maritimi*** DIETEL in Ann. Myc. XX, p. 293, 1922.

Syn. *Puccinia efferta* CUMMINS in Ann. Myc. XXXV, p. 102 & fig. 6, 1937 (*syn. nov.*).

Hab. On *Cirsium brevicaule* A. GRAY (*Shima-azami*). Takamine-mura

(Shimajiri-gun) (H.f., *nos. 190* & *191*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 339*); Haneji-mura (Kunigami-gun) (H.f., *no. 298*); Yontanzan-mura (Nakagami-gun) (Y.T., *no. 381*); Kunigami-mura (Kunigami-gun) (Y.T., *no. 445*).

The present species is new to the mycological flora of the Riukiu Islands.

46. ***Puccinia citrata*** SYDOW in Ann. Myc. X, p. 78, 1912.

Hab. On *Andropogon micranthus* KUNTH. (*Hime-aburasusuki*). Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 241*).

This species is new to the Riukius.

47. ***Puccinia citrina*** SYDOW, Monogr. Ured. I, p. 634 & pl. XXXVI, fig. 483, 1903.

Hab. On *Smilax China* L. (*Sarutoriibara*). Urazoe-mura (Nakagami-gun) (Y.T., *nos. 359* & *360*); Nawa-shi (H.f., *no. 130*); Shuri-shi (Y.T., *no. 342*).

The present species is new to the Riukius.

48. ***Puccinia congesta*** BERKELEY et BROOME in Jour. Linn. Soc. XI, p. 91, 1871. (HIRATSUKA, f. in Jour. Jap. Bot. XIII, p. 589, 1937; Bot. Mag. Tokyo, LIV, p. 162, 1940).

Hab. On *Ampelygonum umbellatum* MASAMUNE (*Tsuru-soba*). Shuri-shi (H.; H.f., *nos. 3, 13* & *27*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 333*); Takamine-mura (Shimajiri-gun) (H.f., *nos. 180* & *186*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *nos. 215* & *249*); Nago-machi (H.f., *no. 102*); Haneji-mura (Kunigami-gun) (H.f., *no. 210*); Motobu-mura (Kunigami-gun) (Y.T., *no. 471*).

49. ***Puccinia Convolvuli*** (PERS.) CASTAGNE, Observ. Fl. Ured. I, p. 16, 1842. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 163, 1940).

Hab. On *Ipomoea denticulata* CHOIS. (*Sokobeni-hamahirugawo*). Onna-mura (Kunigami-gun) (H.f., *no. 61*); Haneji-mura (Kunigami-gun) (H.f., *nos. 273* & *299*).

50. ***Puccinia Crepidis-japonicae*** DIETEL in Ann. Myc. VI, p. 226, 1908. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 163, 1940).

Hab. On *Youngia japonica* DC. (*Crepis japonica* BENTH.) (*Oni-tabirako*). Motobu-mura (Kunigami-gun) (Y.T., *no. 469*); Haneji-mura (Kunigami-gun) (H.f., *no. 96*); Nago-machi (H.f., *no. 108*; Y.T., *no. 474*), Onna-mura (Kunigami-gun) (H.f., *nos. 65* & *79*); Shuri-shi (H.f., *nos. 5* & *23*); Nishihara-mura (Nakagami-gun) (H.f., *no. 175*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 157*); Oroku-mura (Shimajiri-gun) (H.f., *no. 124*); Takamine-mura (Shimajiri-gun) (H.f., *nos. 183* & *189*); Nawa-shi (H.f., *no. 28*).

51. ***Puccinia Cynodontis*** LACROIX in DESM., Pl. Crypt. II, no. 655, 1859. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 163, 1940).

Hab. On *Cynodon Dactylon* PERS. (*Gyôgi-shiba*). Haneji-mura (Kunigami-gun) (H.f., *nos. 97* & *206*; Y.T., *no. 449*).

52. ***Puccinia erebia*** SYDOW in Philippine Jour. Sci. VIII, Bot. p. 475, 1913. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 163, 1940).

Hab. On *Clerodendron ineome* GAERTN. (*Ibota-kusagi*). Haneji-mura (Kunigami-gun) (H.f., *nos. 267* & *268*); Nawa-shi (H.f., *nos. 134* & *141*; Y.T., *no. 399*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 177*); Itoman-machi (H.f., *no. 310*); Yontanzan-mura (Nakagami-gun) (Y.T., *no. 379*).

53. ***Puccinia erythropus*** DIETEL in ENGL. Bot. Jahrb. XXXVII, p. 101, 1905. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Miscanthus sinensis* ANDERS. (*Susuki*). Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 195*).

54. ***Puccinia exhausta*** DIETEL in ENGL. Bot. Jahrb. XXVIII, p. 283, 1900. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Clematis grata* WALL. (*Ke-botandzuru*). Nawa-shi (H.f., *no. 143*; Y.T., *no. 411*); Shuri-shi (H.f., *nos. 17, 25* & *26*); Nago-machi (H.f., *no. 237*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 256*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 312*); Takamine-mura (Shimajiri-gun) (H.f., *no. 185*); Kochinda-mura (Shimajiri-gun) (Y.T., *no. 420*).

55. ***Puccinia ferruginosa*** SYDOW, Monogr. Ured. I, p. 13, 1902. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Artemisia dubia* WALL. (*Yomogi*) Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 260*); Haneji-mura (Kunigami-gun) (H.f., *no. 283*; Y.T., *no. 429*).

56. ***Puccinia filipodia*** CUMMINS in Ann. Myc. XXXV, p. 98 & text-fig. 7, 1937. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 375, 1940).

Hab. On *Heteropogon contortus* BEAUV. (*Andropogon contortus* L.) (*Akahige-gaya*). Urazoe-mura (Nakagami-gun) (Y.T., *nos. 388* & *389*).

57. ***Puccinia graminis*** PERSOON in Neues Mag. Bot. I, p. 119, 1794; Syn. Fung. p. 228, 1801. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 375, 1940).

Hab. On *Hordeum sativum* JESS. var. *hexastichon* HACK. (*Ô-mugi*) (*cultivated*). Urazoe-mura (Nakagami-gun) (Y.T., *no. 394*).

On *Triticum vulgare* VILL. (*Ko-mugi*) (*cultivated*). Yontanzan-mura

(Nakagami-gun) (Y.T., *no. 384*); Ginowan-mura (Nakagami-gun) (Y.T., *no. 370*).

58. ***Puccinia Hemerocallidis*** THÜMEN in Bull. Soc. Imp. Nat. Moscou, LV, p. 81, 1880. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Hemerocallis disticha* DONN. (*No-kwanzô*). Haneji-mura (Kunigami-gun) (H.f., *no. 91*; Y.T., *no. 426*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 337*); Motobu-mura (Kunigami-gun) (Y.T., *no. 468*).

59. ***Puccinia incompleta*** SYDOW in Ann. Myc. X, p. 261, 1912.

Hab. On *Ischaemum crassipes* THELL. var. *formosanum* NAKAI (*Taiwan-kamonohashi*). Nago-machi (Y.T., *no. 451*; H.f., *no. 244*).

This species is new to the Riukius.

60. ***Puccinia Kuhnii*** (KRÜG.) BUTLER in Ann. Myc. XII, p. 82, 1914. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Saccharum arundinaceum* RETZIUS (*Yoshi-susuki*). Nawa-shi (H.f., *no. 51*).

61. ***Puccinia Kusanoi*** DIETEL in ENGL. Bot. Jahrb. XXVII, p. 569 & pl. VII, figs. 14 & 15, 1900.

Hab. On *Pleioblastus linearis* NAKAI (*Yanbaru-medake*). Shuri-shi (Y.T., *no. 347*).

The present species is new to the Riukiu Islands.

62. ***Puccinia Kyllingiae-brevifoliae*** MIURA in ITO & HOMMA in Transact. Sapporo Nat. Hist. Soc. XV, p. 128, 1938. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Kyllingia brevifolia* ROTTB. (*Hime-kugu*). Nago-machi (H.f., *nos. 103* & *104*); Haneji-mura (Kunigami-gun) (H.f., *no. 88*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 254*); Takamine-mura (Shimajiri-gun) (H.f., *no. 188*).

63. ***Puccinia Lactucae-debilis*** DIETEL in Ann. Myc. VI, p. 225, 1908. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 164, 1940).

Hab. On *Ixeris japonica* NAKAI (*Jishibari*). Kunigami-mura (Kunigami-gun) (Y.T., *no. 433*); Kiyan-mura (Shimajiri-gun) (Y.T., *no. 374*).

On *Ixeris stolonifera* A. GRAY (*Iwanigana*). Haneji-mura (Kunigami-gun) (H.f., *no. 201*); Nago-machi (H.f., *no. 106*).

64. ***Puccinia Lepturi*** HIRATSUKA, f. nov. spec.

Soris uredosporiferis amphigenis, sparsis vel aggregatis confluentibusque, oblongis vel confluendo linearibus, epidermide rupta cinctis, pulverulentis, cin-

namomeis; uredosporis globosis, subglobosis vel ellipsoideis, echinulatis, flavo-brunneis, 20–28 × 17–25 μ; episporio 2–2.5 μ crasso, poris germinationis 4–7 sparsis praeditis; soris teleutosporiferis conformibus, obscure brunneis; teleutosporis subglobosis, ellipsoideis vel obovatis, utrinque rotundatis, medio non constrictis, levibus, castaneo-brunneis, 25–32 × 21–27 μ; episporio 3–4 (–7) μ crasso; pedicello usque 40 μ longo, brunneolo.

Hab. On *Lepturus repens* R. BR. (*Hai-shiba*). Nawa-shi (Jan. 9, 1940, HIRATSUKA, f., *no. 11*); Yagaji-shima (Haneji-mura) (Kunigami-gun) (Jan. 15, 1940, HIRATSUKA, f., *no. 277, type!*).

65. ***Puccinia levigata*** HIRATSUKA, f. in HIRATSUKA, f. & YOSHINAGA in Mem. Tottori Agric. Coll. III, p. 315, 1935. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 375, 1940).

Syn. *Diorchidium levigatum* SYDOW et BUTLER in Ann. Myc. V, p. 500, 1907; ITO in Jour. Coll. Agric. Tohoku Imp. Univ. III, p. 239 & pl. XII, fig. 7, 1909.

Hab. On *Oplismenus compositus* BEAUV. (*Edauchi-chijimizasa*). Shuri-shi (H.; Y.T., *nos. 349* & *478*).

66. ***Puccinia levis*** (SACC. et BIZZ.) MAGNUS in Ber. Deutsch. Bot. Ges. IX, p. 190 & pl. IX, figs. 28–37, 1891. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 376 & text-fig. 1, e, 1940).

Hab. On *Digitaria Henryi* RENDLE (*Mehishiba*). Nishihara-mura (Nakagami-gun) (H.f., *nos. 168, 169* & *173*).

On *Digitaria timorensis* BALANSA (*Chimôru-mehishiba*). Nishihara-mura (Nakagami-gun) (H.f., *no. 174*)

67. ***Puccinia Lophatheri*** (SYD.) HIRATSUKA, f. in Jour. Jap. Bot. XIV, p. 36, 1938. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Lophatherum gracile* BRONG. var. *elatum* HACK. (*Sasakusa*). Shuri-shi (H.f., *no. 45*); Mt. Onna-dake (Kunigami-gun) (H.f., *no. 73*); Nago-machi (T.M.); Mt. Benoki-yama (Y.T., *no. 431*).

68. ***Puccinia minussensis*** THÜMEN in Bull. Soc. Imp. Nat. Moscou, LIII, p. 214, 1878. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Lactuca indica* L. (*Aki-no-nogeshi*). Mawashi-mura (Shimajiri-gun) (H.f., *no. 328*; Y.T., *nos. 356* & *414*); Oroku-mura (Shimajiri-gun) (H.f., *no. 127*); Urazoe-mura (Kunigami-gun) (Y.T., *nos. 391* & *392*).

69. ***Puccinia Miyoshiana*** DIETEL in ENGL. Bot. Jahrb. XXVII, p. 569 & pl. VII, figs. 16 & 17, 1899. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV,

p. 376, 1940).

Hab. On *Eccoilopus cotulifer* A. CAMUS (*Abura-susuki*). Mt. Katsuu-dake (Kunigami-gun) (Y.T., *no. 464*).

70. ***Puccinia Nanbuana*** HENNINGS in Hedwigia, XL, p. (26), 1901.

Hab. On *Angelica kiusiana* MAXIM. (*Oni-udo*). Mabuni-mura (Shimajiri-gun) (Y.T., *no. 371*).

The present species is new to the Riukiu Islands.

71. ***Puccinia Oenanthes-stoloniferae*** S. ITO in TRANZSCHEL, Conspect. Ured. URSS, p. 299, 1939.

Syn. *Puccinia Oenanthes* T. MIYAKE in Jour. Sapporo Agric. Coll. II, p. 106 & pl. III, fig. 3, 1906. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Oenanthe javanica* DC. (*Seri*). Shuri-shi (H.; Y.T., *no. 393*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 302*); Nawa-shi (Y.T., *no. 366*); Takamine-mura (Shimajiri-gun) (H.f., *no. 181*); Haneji-mura (Kunigami-gun) (Y.T., *no. 427*).

72. ***Puccinia philippinensis*** SYDOW in Philippine Jour. Sci. VIII, no. 4, sect. C, Bot. p. 266, 1913. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Cyperus rotundus* L. (*Hama-suge*). Takamine-mura (Shimajiri-gun) (H.f., *no. 184*); Ginowan-mura (Nakagami-gun) (Y.T., *no. 369*).

73. ***Puccinia Phragmitis*** (SCHUM.) KÖRNICKE in Hedwigia, XV, p. 179, 1876. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 376, 1940).

Hab. On *Phragmites prostrata* MAK. (*Tsuru-yoshi*). Tomigusuku-mura (Shimajiri-gun) (Y.T., *no. 363*).

74. ***Puccinia Phyllostachydis*** KUSANO in Bull. Coll. Agric. Tokyo Imp. Univ. VIII, p. 2 & pl. VI, figs. 1, 2, 10 & 11, 1908.

Hab. On *Sinoarundinaria aurea* HONDA (*Hotei-chiku*). Nawa-shi (Y.T., *no. 346*); Urazoe-mura (Nakagami-gun) (Y.T., *no. 358*).

The present species is a new addition to the flora of the Riukiu Islands.

75. ***Puccinia Polliniae-imberbis*** HIRATSUKA, f. in Jour. Jap. Bot. XIII, p. 248 & text-fig. 1, 1937. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 376, 1940).

Hab. On *Microstegium ciliatum* A. CAMUS var. *Wallichianum* HONDA (*Ô-sasagaya*). Tomigusuku-mura (Shimajiri-gun) (Y.T., *no. 364*).

76. ***Puccinia Polygoni-amphibii*** PERSOON, Syn. Fung. p. 227, 1801. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 376, 1940).

Hab. On *Pleuropterus multiflorus* TURCZ. (*Tsurudokudami*). Nawa-shi (Y.T., *nos. 413* & *480*).

77. ***Puccinia rubigo-vera*** (DC.) WINTER in Pilze Deutschl. I, p. 217, 1881.

Syn. *Puccinia Agropyri* ELLIS et EVERHART in Jour. Myc. VII, p. 131, 1892.

Hab. On *Agropyrum semicostatum* NEES. (*Kamoji-gusa*). Shuri-shi (Y.T., *no. 385*).

78. ***Puccinia rufipes*** DIETEL in ENGL. Bot. Jahrb. XXXII, p. 48, 1902. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Imperata cylindrica* BEAUV. var. *Koenigii* DURAND et SCHINZ (*Chigaya*). Shuri-shi (H.f., *no. 36*); Onna-mura (Kunigami-gun) (H.f., *no. 60*); Haneji-mura (Kunigami-gun) (H.f., *no. 282*).

79. ***Puccinia Scirpi-ternatani*** HIRATSUKA, f. nov. spec.

Soris teleutosporiferis hypophyllis, sparsis vel seriatim dispositis, elongatis vel linearibus, saepe secus lineas elongatis confluentesque dispositis, mox nudis, pulvinatis, atro-brunneis vel atris; teleutosporis clavatis vel fusoideo-clavatis, apice conico-attenuatis, valde incrassatis (4–10 μ), medio plerumque leniter constrictis, basi attenuatis, levibus, flavo-brunneis vel brunneis, 55–70 × 11–18 μ; pedicello flavo-brunneis, persistenti, usque 60 μ longo.

Hab. On *Scirpus ternatanus* REINWARDT (*Ô-aburagaya*). Mt. Benoki-yama (Kunigami-gun) (April 11, 1940, Y. TAIRA, *no. 441, type!*).

This species is closely related to *Puccinia angustata* PECK, but it differs from the latter in narrower and paler teleutospores.

80. ***Puccinia Scleriae*** (PAZ.) ARTHUR in Mycologia, IX, p. 75, 1917. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Scleria scrobiculata* NEES. et MEYEN. (*Ô-shinjyugaya*). Shuri-shi (H.f., *no. 48*; Y.T., *no. 419*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *nos. 245* & *246*); Mt. Benoki-yama (Kunigami-gun) (Y.T., *no. 442*).

81. ***Puccinia sikokiana*** DIETEL in ENGL. Bot. Jahrb. XXXIV, p. 584, 1905.

Hab. On *Carex brunnea* THUNB. (*Kogome-suge*). Ôsato-mura (Shimajiri-gun) (H.f., *no. 166*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 230*).

The present species is new to the Riukius.

82. ***Puccinia taiwaniana*** HIRATSUKA, f. et HASHIOKA in Transact. Tottori Soc. Agric. Sci. VI, p. 240, 1935. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 376, 1940).

Hab. On *Panicum patens* L. (*Hime-chigozasa*). Haneji-mura (Kunigami-gun) (H.f., *nos. 94* & *95*).

83. ***Puccinia tokyensis*** SYDOW, Monogr. Ured. I, p. 377, 1902.

Hab. On *Cryptotaenia japonica* HASSK. (*Mitsuba-zeri*). Tamashiro-mura (Shimajiri-gun) (?).

This species is new to the Riukius.

84. ***Puccinia Wattiana*** BARCLAY in Jour. Asiatic Soc. Bengal, LIX, p. 109, 1890. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 165, 1940).

Hab. On *Clematis Tashiroi* MAXIM. (*Yaeyama-senninsô*). Nago-machi (H.f., *no. 293*); Motobu-mura (Kunigami-gun) (Y.T., *no. 455*).

85. ***Puccinia Zoysiae*** DIETEL in ENGL. Bot. Jahrb. XXXII, p. 48, 1902.

Syn. *Puccinia Ischaemi* DIETEL in Ann. Myc. XV, p. 493, 1917 (*syn. nov.*).

Hab. On *Zoysia liukiuensis* HONDA (*Ko-onishiba*). Shuri-shi (H.f., *nos. 53* & *56*); Yagaji-shima (Haneji-mura) (Kunigami-gun) (H.f., *no. 272*).

On *Zoysia macrostachya* FRANCH. et SAV. (*Oni-shiba*). Kunigami-mura (Kunigami-gun) (Y.T., *no. 444*).

On *Zoysia sinica* HANCE. (*Nagami-no-onishiba*). Onna-mura (Kunigami-gun) (H.f., *no. 59*); Yontanzan-mura (Nakagami-gun) (Y.T., *no. 383*).

On *Zoysia tenuifolia* TRIN. (*Ito-shiba*). Sashiki-mura (Shimajiri-gun) (H.f., *nos. 153* & *155*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 161*); Nishihara-mura (Nakagami-gun) (H.f., *no. 172*); Nawa-shi (H.f., *nos. 131* & *135*).

This species is now first reported from the Riukius.

86. ***Endophyllum emasculatum*** ARTHUR et CUMMINS in Philippine Jour. Sci. LXI, p. 475, 1936.

Syn. *Aecidium Breyniae* (not SYDOW) (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 166, 1940).

Hab. On *Breynia rhamnoides* MÜLL.-ARG. (*Ôshima-koban-no-ki*). Shuri-shi (H.f., *nos. 20* & *24*); Nawa-shi (H.f., *no. 136*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 332*); Sashiki-mura (Shimajiri-gun) (H.f., *no. 152*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 158*); Kanegusuku-mura (Shimajiri-gun) (H.f., *nos. 193* & *312*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 250*); Oroku-mura (Shimajiri-gun) (H.f., *nos. 123* & *128*).

Uredinales imperfecti

87. ***Aecidium formosanum*** SYDOW in Ann. Myc. XI, p. 56, 1913. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 166, 1940).

Hab. On *Emilia sonchifolia* DC. (*Usubeni-nigana*). Nawa-shi (H.f., *no. 31*); Shuri-shi (H.f., *no. 39*); Mawashi-mura (Shimajiri-gun) (H.f., *no. 334*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 199*); Nishihara-mura (Nakagami-gun) (H.f., *no. 176*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *no. 248*); Nago-machi (H.f., *no. 300*).

88. ***Aecidium Lysimachiae-japonicae*** DIETEL in ENGL. Bot. Jahrb. XXXIV, p. 590, 1905. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 377, 1940).

Hab. On *Lysimachia japonica* THUNB. (*Konasubi*). Mt. Katsuu-dake (Kunigami-gun) (Y.T., *no. 465*); Motobu-mura (Kunigami-gun) (Y.T., *no. 467*).

89. ***Aecidium Mori*** BARCLAY in Jour. Asiatic Soc. Bengal, LX, pt. 2, p. 226, 1891. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 166, 1940).

Hab. On *Morus australis* POIR. (*Shima-guwa*). Nago-machi (H.f., *no. 240*); Haneji-mura (Kunigami-gun) (H.f., *no. 280*); Mabuni-mura (Shimajiri-gun) (Y.T., *no. 373*).

90. ***Aecidium Paederiae*** DIETEL in Hedwigia, XXXVI, p. 297, 1897. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 166, 1940).

Hab. On *Paederia chinensis* HANCE. (*Yaito-bana*). Shuri-shi (H.f., *nos. 19, 21* & *22*); Haneji-mura (Kunigami-gun) (H.f., *nos. 265* & *274 a*); Kanegusuku-mura (Shimajiri-gun) (H.f., *no. 315*).

91. ***Aecidium Rhaphiolepidis*** SYDOW in Ann. Myc. XX, p. 61, 1922. (HIRATSUKA. f. in Bot. Mag. Tokyo, LIV, p. 166, 1940).

Hab. On *Rhaphiolepis liukiuensis* NAKAI (*Hosoba-sharinbai*). Mt. Onna-dake (Kunigami-gun) (H.f., *no. 84*); Mt. Katsuu-dake (Kunigami-gun) (H.f., *nos. 224* & *264*).

92. ***Uredo Alocasiae*** SYDOW, Monogr. Ured. IV, p. 521, 1924. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 377, 1940).

Hab. On *Alocasia macrorhiza* SCHOTT. (*Kuwadzu-imo*). Shuri-shi (H.f., *nos. 2* & *4*); Nawa-shi (H.f., *nos. 325* & *326*).

93. ***Uredo Arthraxonis-ciliaris*** HENNINGS in Hedwigia, XLVIII, p. 251, 1908. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 377, 1940).

Hab. On *Arthraxon hispidus* MAK. (*Kobunagusa*). Kanegusuku-mura (Shi-

majiri-gun) (H.f., *no. 309*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 165*); Takamine-mura (Shimajiri-gun) (H.f., *no. 192*); Shuri-shi (Y.T., *no. 451*).

94. ***Uredo Crepidis-integrae*** LINDROTH in Acta Soc. pro Fauna et Flora fennica, XXII, no. 3, p. 11, 1902. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 377, 1940).

Hab. On *Crepidiastrum lanceolatum* NAKAI (*Heranaren*). Chinen-mura (Shimajiri-gun) (H.f., *nos. 145, 146* & *147*); Takamine-mura (Shimajiri-gun) (Y.T., *no. 405*); Yontanzan-mura (Nakagami-gun) (Y.T., *no. 380*).

95. ***Uredo paspalina*** SYDOW in Ann. Myc. XV, p. 177, 1917.

Hab. On *Paspalum scrobiculatum* L. (*Suzume-no-kobie*). Haneji-mura (Kunigami-gun) (Y.T., *no 425* & *447*); Ôsato-mura (Shimajiri-gun) (H.f., *no. 162*).

The present species is new to the Riukius.

96. ***Uredo taiwaniana*** HIRATSUKA, f. et HASHIOKA in Bot. Mag. Tokyo, XLVIII, p. 239, 1934. (HIRATSUKA, f. in Bot. Mag. Tokyo, LIV, p. 377, 1940).

Hab. On *Epipremnum mirabile* SCHOTT. (*Habu-kazura*). Shuri-shi (Y.T., *no. 397*).

Geographical distribution

Eighty-six species of rust fungi found in Okinawa Island excluding 10 species of form-genera, are distributed in districts in our country other than Okinawa Island and also in other regions of the world as shown in the following table.

Table 2. Geographical distribution of species of rust fungi found in Okinawa Island

Species \ Regions	Japan																	
	Formosa	Shikoku & Kiushû	Honshû	Korea	Hokkaidô	S. Saghalien	Philippines & Java	N. China & Manchuria	Siberia	India	Europe	North America	South America	Africa	Australia
Milesina microspora	•	+	+												
M. Odontosoriae	•	+													
Hyalopsora Polypodii	+	+	+	•	+	+	•	•	+	•	+	+			

Table 2. (*Continued*)

Species \ Regions	Japan						Philippines & Java	N. China & Manchuria	Siberia	India	Europe	North America	South America	Africa	Australia
	Formosa	Shikoku & Kiushû	Honshû	Korea	Hokkaidô	S. Saghalien									
Pucciniastrum Agrimoniae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
Phakopsora Ampelopsidis	+	+	+	+	+	•	+	•	•	•	•	+	+		
Ph. Artemisiae	+	+	+	+	+	•	+	+							
Ph. Ehretiae	+	+	+	•	•	•	•	•	•	+					
Ph. formosana	+														
Ph. tecta	+	•	•	•	•	•	+	•	•	•	•	•	+		
Coleopucciniella Idei	•	+													
Coleosporium Asterum	+	+	+	+	+	+	•	+							
C. Bletiae	+	+	+	•	•	•	+	•	•	•	•	+			
C. Carpesii	+	+	+	•	•	•	+	•	•	•	+				
C. Clematidis	+	+	+	+	+	•	+	+	•	+	•	•	+	+	
C. Clerodendri	+	+	+	•	•	•	+	+							
C. Paederiae	+	+	+	•	•	•	+								
C. Perillae	+	+	+	+	•	•	+	+	•	+					
Skierka Agallocha	•	•	•	•	•	•	+								
Ctenoderma Toddaliae	+	•	•	•	•	•	•	•	•	+					
Kuehneola Callicarpae	•	+	+	•	•	•	+								
Hamaspora acutissima	+	•	•	•	•	•	+	•	•	+	•	•	•	•	+
H. Rubi-Sieboldii	•	+													
Poliostelium hyalospora	+														
Angiospora divina	+														
Pileolaria Shiraiana	+	+	+	+	+	•	•	+							
Ravenelia Hobsoni	+	•	•	•	•	•	•	•	•	+					
R. tephrosiicola	+	•	•	•	•	•	+	•	•	+					

Table 2. (*Continued*)

Species \ Regions	Japan																
	Formosa	Shikoku & Kiushû	Honshû	Korea	Hokkaidô	S. Saghalien	Philippines & Java	N. China & Manchuria	Siberia	India	Europe	North America	South America	Africa	Australia
Phragmidium griseum	+	+	+	+	+	•	•	+	+						
Ph. pauci.oculare	+	+	+	+	+	•	•	+							
Uromyces appendiculatus	+	+	+	+	+	•	+	+	+	+	+	+	+	+	+
U. Commelinae	+	+	+	+	•	•	+	+	•	+	•	+	+	+	
U. Fabae	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
U. Lespedezae-procumbentis	+	+	+	+	+	•	•	+	+	+	•	+			
U. linearis	+	+	•	•	•	•	+	•	•	+					
U. Mucunae	+	•	•	•	•	•	+	•	•	+	•	•	•	+	
U. pyriformis	+	+	•	•	•	•	+	+	•	•	•	+			
U. Setariae-italicae	+	+	+	+	•	•	+	+	+	+					
U. striatus	+	+	•	•	•	•	•	+	+	+	+	+	+	+	+
U. Tairae															
U. tenuicutis	+	+	+	•	•	•	+	•	•	•	•	•	•	+	+
U. Vignae	+	+	+	+	+	•	+	+	+	+	+	+	+	+	+
Puccinia Absinthii	+	+	+	+	+	+	•	+	+	+	+	+	+	+	
P. anomala	+	+	+	+	+	+	•	+	+	+	+	+	+	+	+
P. benokiyamensis															
P. Cirsii-maritimi	+	+	+	•	•	•	+								
P. citrata	+	•	•	•	•	•	+								
P. citrina	+	•	•	•	•	•	+								
P. congesta	+	+	•	•	•	•	+	•	•	+					
P. Convolvuli	•	+	+	+	+	•	+	+	+	•	+	+	+		
P. Crepidis-japonicae	+	+	+		+										
P. Cynodontis	+	+	+	+	•	•	+	+	+	+	+	+	+	+	+

Table 2. (*Continued*)

Species \ Regions	Japan						Philippines & Java	N. China & Manchuria	Siberia	India	Europe	North America	South America	Africa	Australia
	Formosa	Shikoku & Kiushû	Honshû	Korea	Hokkaidô	S. Saghalien									
Puccinia erebia	+	•	•	•	•	•	+								
P. erythropus	•	+	+	•	•	•	+								
P. exhausta	+	+	+	•	•	•	+								
P. ferruginosa	+	+	+	+	+	+	+	+	+	+					
P. filipodia	•	•	•	•	•	•	+								
P. graminis	+	+	+	+	+	+	•	+	+	+	+	+	+	+	+
P. Hemerocallidis	+	+	+	+	+	+	•	+							
P. incompleta	+	•	•	•	•	•	+	•	•	+					
P. Kühnii	+	•	•	•	•	•	+	•	•	+					
P. Kusanoi	•	+	+	•	•	•	•	+							
P. Kyllingiae-brevifoliae	+	+	+												
P. Lactucae-debilis	+	+	+												
P. Lepturi															
P. levigata	+	•	•	•	•	•	•	•	•	+					
P. levis	+	•	•	•	•	•	+	•	•	•	•	•	+		
P. Lophatheri	+														
P. minussensis	+	+	+	+	+	+	•	+	+						
P. Miyoshiana	•	+	+	+	+	•	•	+	+						
P. Nanbuana	•	+	+	•	+	+	•	+	+						
P. Oenanthes-stoloniferae	+	+	+	+	+	•	•	+							
P. philippinensis	+	+	•	•	•	•	+	•	+						
P. Phragmitis	•	+	+	•	+	+	•	+	•	+	+	+	+	+	+
P. Phyllostachydis	•	+	+	•	•	•	•	+							
P. Polliniae-imberbis	+	+													

Table 2. (*Continued*)

Species \ Regions	Japan						Philippines & Java	N. China & Manchuria	Siberia	India	Europe	North America	South America	Africa	Australia
	Formosa	Shikoku & Kiushû	Honshû	Korea	Hokkaidô	S. Saghalien									
Puccinia Polygoni-amphibii	+	+	+	+	+	+	+	+	+	+	+	+	+	+	
P. rubigo-vera	+	+	+	+	+	+	•	+	+	+	+	+	+	•	+
P. rufipes	+	+	+	•	•	•	+	+	+	+	•	•	•	+	
P. Scirpi-ternatani															
P. Scleriae	+	•	•	•	•	•	+	•	•	•	•	•	+		
P. sikokiana	•	+	+												
P. taiwaniana	+														
P. tokyensis	•	+	+	+	+										
P. Wattiana	+	•	•	•	•	•	+	•	•	+					
P. Zoysiae	+	+	+	+	•	•	+	+	•	+					
Endophyllum emasculatum	+	•	•	•	•	•	+								
Total	66	59	50	29	28	14	44	35	22	32	15	20	20	17	11

Table 3 shows for each region the number of genera and species common to Okinawa Island and the ratio borne by this number of species to the total number of species in the island.

Table 3. Relationship between the rust-flora of Okinawa Island and that of its neighbouring and other regions

Regions	Number of genera common to Okinawa Isl.	Number of species common to Okinawa Isl.	Ratio to the total number of species in Okinawa Isl. (%)
Formosa	13	66	76.74
Shikoku & Kiushû	12	59	68.60
Honshû	10	50	58.13
Philippines & Java	11	44	51.16
N. China & Manchuria	7	35	40.70

Table 3. (*Continued*)

Regions	Number of genera common to Okinawa Isl.	Number of species common to Okinawa Isl.	Ratio to the total number of species in Okinawa Isl. (%)
India	9	32	37.21
Korea	7	29	33.72
Hokkaidô	8	28	32.56
Siberia	5	22	25.58
North America	7	20	23.26
South America	7	20	23.26
Africa	5	17	19.77
Europe	4	15	17.44
S. Saghalien	5	14	16.28
Australia	3	11	12.97

As shown in the preceding tables, the study of the rust-flora of Okinawa Island shows that it is closely connected on the one hand with that of Formosa and the Philippines & Java, and on the other hand with that of Shikoku & Kiushû and Honshû. The resemblance to the rust-flora of Formosa is greatest, 76.74 per cent of the species in Okinawa Island being recorded also in Formosa; the next comes that of Shikoku & Kiushû, then that of Honshû and that of the Philippines & Java, each having more than 50 per cent of the species in in the island.

Bibliography of Uredinales found in Okinawa Island

1. HIRATSUKA, NAOHARU: Notes on some Melampsorae of Japan, III. Japanese species of *Phacopsora*. (Bot. Mag. Tokyo, XIV, p. 87~93 & pl. III, 1900).
2. HIRATSUKA, NAOHIDE: *Phakopsora* of Japan, III. (*Ibid.*, L, p. 2~8, 1936).
3. ———: Miscellaneous notes on the East-Asiatic Uredinales with special reference to the Japanese species, I. (Jour. Jap. Bot. XIII, p. 244~251, 1937); II (*Ibid.*, XIII, p. 587~594, 1937); III (*Ibid.*, XIV, p. 33~38, 1938).
4. ———: Materials for a rust-flora of Riukiu Islands, I. (Bot. Mag. Tokyo, LIV, p. 157~167, 1940); II (*Ibid.*, LIV, p. 373~377, 1940).
5. ——— & Y. TAIRA: Notes on an interesting species of the rust fungi from Okinawa Island. (Bot. & Zool., VIII, p. 1641~1642, 1940).
6. ITO, S.: On the Uredineae parasitic on the Japanese Gramineae. (Jour. Coll. Agric. Tohoku Imp. Univ. III, p. 180~262 & 3 pl., 1909).
7. ———: *Uromyces* of Japan. (Jour. Coll. Agric. Hokkaido Imp. Univ. XI, p. 211~287 & pl. VII~IX, 1922).
8. ———: Mycological flora of Japan, II, no. 2, 1938.
9. MIYAKE, T.: On *Puccinia* parasitic on the Umbelliferae of Japan. (Jour. Sapporo Agric. Coll. II, p. 97~132 & 1 pl., 1906).