

THE SOUTH AFRICAN RUST FUNGI.

I. THE SPECIES OF PUCCINIA ON COMPOSITAE.

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(From the Botanical Laboratories, Union of South Africa, Pretoria.)

(Read August 18, 1915.)

(Plates XLV-XLIX.)

The following descriptions and accompanying notes are based mainly upon material which the author and his colleagues have collected during the past ten years in South Africa, and which is now represented in the Mycological Herbarium of the Union of South Africa at Pretoria.

The material has been collected primarily with the object of elucidating the life-histories of the various rusts which are so destructive to many of our economic crops, and it is hoped that the descriptions of these parasites, of which this is the first instalment, may promote a more widespread interest in this group of plants and may be the means of adding considerably to our present very imperfect knowledge of these fungi.

What has hitherto been published on the South African rusts is very largely due to the labours of MacOwan in the Cape, and Medley Wood in Natal. The greater portion of the material was culled from the collections of these two botanists, and from botanical collectors who visited the country from time to time.

The descriptions of practically all the species were consequently published by European mycologists in scientific journals of European origin, many of which are not obtainable in South Africa to-day, and in many instances the descriptions were based on scanty and immature material.

It will not be surprising, therefore, to find that the number of species occurring in South Africa must be considerably added to, while existing species may require amending.

The descriptions of the species in this and following contributions will in the main be those of P. and H. Sydow's *Monographia Uredinearum*, although I shall not scruple to amend them from my own observations whenever this may appear necessary. I also propose to follow the arrangement of species as is done by P. and H. Sydow in the above-named work. For descriptions of new species I alone am responsible. All the species

which are known to occur in South Africa will be included whether they be aliens or not, and every species of which specimens are available will be figured in its essential parts.

All the spores are drawn to the same magnification of 600 times unless it is stated to the contrary.

1. The Species of *Puccinia* on Compositae.

Sydow's *Monographia Uredinearum*, published in 1904, records seven species of *Puccinia* on Compositae from South Africa.

Of these, *Puccinia Stobaeae* MacOwan, *P. Kalchbrenneri* De Toni, *P. Printziae* Thuem., *P. aecidiiformis* Thuem., and *P. oedipus* Cke., are recorded from South Africa only, while *P. MacOwani* Wint. is reported from South and Central Africa, and *P. africana* Cke. from Abyssinia, Madagascar, South and Tropical Africa.

The present paper records fourteen species of *Puccinia* on Compositae in South Africa, and describes four new species. Of the remainder, *Puccinia vernicola* P. Henn. has previously been recorded from Tropical East Africa, while *P. Chrysanthemi* Roze and *P. Hypochoeridis* Oud. have a wide distribution.

The descriptions of the species on Compositae are as follows :

BERKHEYA Ehrh.

1. *Puccinia Stobaeae* MacOwan.

Puccinia cryptica Cke. *Grevillea* xx, p. 108; *Sacc. Syll.* xi, p. 190.

Puccinia Stobaeae MacOwan. *Grevillea* xi, p. 23; *Sacc. Syll.* vii, p. 615.

Sydow, *Monogr.* i, p. 158, f. 137.

Aecidiospores.—*Aecidia* hypophyllous, on orbicular spots up to $\frac{1}{2}$ cm. diam., sometimes confluent yellow-brownish, aggregated in groups 3-5, white, margin fimbriate-lacerate; spores globose or subglobose, angular, verruculose, hyaline, somewhat yellowish, 21-36 μ diam.

Uredospores.—Sori amphigenous, hidden in the lower surface under the araneose pubescence of the leaf, pulverulent on the upper surface, scattered or running together in irregular clusters, black-fuscous; spores globose or ellipsoid-globose, strongly echinulate, fuscous-brownish, 25-40 μ diam.

Teleutospores.—Sori mostly hypophyllous, scattered or in groups of 4-7, rotund, black, about 1 mm. in diam.; spores ellipsoid or oblong strongly thickened at the apex (up to 14 μ) and mostly more or less lengthened, rarely subrotund, slightly constricted at the middle, mostly rounded at the base, rarely attenuated in the pedicel, smooth, fuscous, 40-68 \times 21-32 μ ; pedicel hyaline, persistent, thick, slightly thickened at the base, up to 124 μ long.

First recorded on leaves of *Berkheya membranifolia* and *speciosa* near Somerset East (MacOwan).

On *Berkheya latifolia*, Pretoria (I. B. Pole Evans), 12:11:1906. (Pole Evans, 204.) I.

On *Berkheya latifolia*, Irene, Pretoria District (I. B. Pole Evans), 2:11:1908. (Pole Evans, 539.) I.

On *Berkheya latifolia*, Koodoespoort, Pretoria (I. B. Pole Evans), 18:11:1908. (Pole Evans, 747.) O. and I.

On *Berkheya* sp., Barberton (I. B. Pole Evans), 4:11:1911. (Pole Evans, 1155.) I, II, and III.

On *Berkheya latifolia*, Garstfontein, Pretoria District (P. J. Pienaar), 8:4:1911. (Pole Evans, 1437.) III.

On *Berkheya Zeyheri*, Spelonken, Zoutpansberg (E. M. Doig), 14:8:1911. (Pole Evans, 1814.) III.

On *Berkheya Zeyheri*, Barberton (I. B. Pole Evans), 29:8:1911. (Pole Evans, 1855.) III.

On *Berkheya latifolia*, Garstfontein, Pretoria District (P. J. Pienaar), 6:12:1911. (Pole Evans, 1948.) I.

On *Berkheya* sp., Zuurvlaakte, Aliwal North (P. J. Pienaar), 15:1:1912. (Pole Evans, 2006.) I, II, and III.

On *Berkheya latifolia*, Garstfontein, Pretoria District (P. J. Pienaar), 15:2:1912. (Pole Evans, 2148.) II and III.

On *Berkheya seminivea*, Garstfontein, Pretoria District (I. B. Pole Evans), 30:3:1912. (Pole Evans, 2185.) II and III.

On *Berkheya latifolia*, Garstfontein, Pretoria District (P. J. Pienaar), 14:5:1913. (Pole Evans, 6659.) III. Plate XLV, figs. 1 and 2.

On *Berkheya latifolia* and *B. seminivea* the uredosori are usually on the upper surface of the leaf, and the teleutosori on the under surface.

1A. *Puccinia Stobaeae* McOwan var. *Woodii* Syd.

Aecidium Stobaeae Kalchbr. and Cke. *Grevillea* viii, p. 70; Sacc. Syll. vii, p. 800.

Puccinia Stobaeae MacOwan. var. *Woodii* Syd. Sydow, Monogr. i, p. 160, f. 138.

Aecidiospores.—*Aecidia* hypophyllous, partly hidden by the tomentum of the leaf, solitary or in groups of 3–5, yellowish, cylindrical, with a pale yellow-white fimbriate-lacerate margin; spores globose, subglobose or ellipsoid, 24–33 μ diam., hyaline-pale yellow, episore, with numerous large crowded prismatic warts, each about 2–2.5 μ wide.

Uredospores.—Sori hypophyllous, forming purple-brown orbicular spots on the upper surface; spores globose, regular, echinulate, obscurely brown, 20–28 μ diam.

Teleutospores.—Spores broadly ellipsoid, rarely sub-oblong, strongly thickened at the apex (up to 11 μ), but always broadly and obtusely rounded at the base, not or very slightly constricted at the middle, obscurely brown,

43-57 × 27-38 μ , pedicel hyaline, persistent, up to 54 μ long, 6 μ thick, thinner at the base.

First recorded on leaves of *Berkheya speciosa* from Natal (J. Medley Wood).

On *Berkheya* sp., Maritzburg (I. B. Pole Evans), 7:4:1911. (Pole Evans, 1446.) II and III.

Berkheya umbellata, Eshowe, Zululand (I. B. Pole Evans), 20:1:1912. (Pole Evans, 2023.) II and III.

On *Berkheya discolor*, Eshowe, Zululand (I. B. Pole Evans), 30:1:1912. (Pole Evans, 2028.)

On *Berkheya* sp., Umgeni Beach, Durban (I. B. Pole Evans), 4:6:1912. (Pole Evans, 2413.) I.

On *Berkheya* sp., Winter's Kloof, Maritzburg (E. M. Doidge), 30:6:1912. (Pole Evans, 2518.) II and III.

On *Berkheya* sp., Estcourt, Natal (I. B. Pole Evans), 29:7:1912. (Pole Evans, 5145.) III. Plate XLV, fig. 3; Plate XLVI, fig. 4.

The aecidiospores of this species are readily distinguished from those of *P. Stobaeae* by the presence of the large prismatic warts on the surface of the spores, whereas the spores of *P. Stobaeae* are delicately verruculose.

This very evident difference between the aecidiospores does not appear to have been noted before.

CHRYSANTHEMUM L.

2. *Puccinia chrysanthemi* Roze.

Uredo chrysanthemi Roze, Plowright, in Trans. Brit. Mic. Soc. i, 1898.

Puccinia chrysanthemi-chinensis, Henn., in Hedw. xl, 26 (1901).

Puccinia chrysanthemi Roze, Bull. Soc. Myc. Fr., 1900, p. 92; Sacc. Syll. xvi, 296; Sydow, Monogr. i, 46, 854; McAlpine, Rusts of Australia. p. 153, f. 251-5 and pl. E, f. 21; Fischer, Ured. Schweiz, p. 190, f. 150; Grove, The British Rust Fungi, p. 131-3, f. 83-4.

Uredospores.—Sori generally hypophyllous, on irregular pallid-yellow or brown spots, scattered or in clusters, about 1-1½ mm. diam., frequently circinate, pulverulent, cinnamon; spores globose, subglobose, or ellipsoid, echinulate, brown, 24-32 × 17-27 μ .

(*Teleutospores*.—Mixed with the uredospores, ellipsoid or oblong-ellipsoid, rounded at the apex, slightly thickened, scarcely constricted, usually rounded at the base, minutely warted, chestnut-brown, 35-43 × 20-25 μ ; pedicel stout, hyaline, persistent, 35-60 μ long; mesospores subglobose or pyriform, rounded at the apex, slightly thickened, minutely warted, chestnut.)

On leaves of cultivated *Chrysanthemum* (*Chrysanthemum indicum* and *C. sinense*) throughout South Africa, and is to be found in the uredo stage all the year round.

Barberton, 14:3:1905. (Pole Evans, 500.)

Johannesburg, 25:5:1905. („ „ 177.)

Pretoria, March, 1909. („ „ 660.)

Natal, 12:4:1912. („ „ 2326.)

Port Elizabeth, 12:4:1912. („ „ 2235.)

I have not as yet seen teleutospores in any South African material.

Europe, Japan, North America, Australia.

DIMORPHOTHECA Vaill.

3. *Puccinia dimorphothecae* Pole Evans, n.sp.

Soris teleutosporiferis amphigenis, sparsis vel irregulariter aggregatis, minute, rotundatis, epidermide lacerata cinctis compactiusculis, castaneo-atris; teleutosporis late ellipsoideis vel oblonga-ellipsoideis, utrinque rotundatis, apice leniter incrassatis, medio non vel vix constrictis, subbilitissime verruculosus, castaneo-brunneis, $33-40 \times 24-26 \mu$; pedicello hyalino, crasso, deciduo, saepe lateraliter inserto, brevi.

On leaves of *Dimorphotheca ecklonis*, Garstfontein, Pretoria District (P. J. Pienaar), 2:5:1911. (Pole Evans, 1499.) Plate XLVI, fig. 5.

GERBERA Gron.

4. *Puccinia gerberae* Pole Evans, n.sp.

Soris teleutosporiferis amphigenis, maculis brunneolis vel purpureis insidentibus, sparsis vel in greges pulvinatis epidermide lacerata cincta, pulverulento - compactiusculis, obscure castaneo - brunneis; teleutosporis ellipsoideis, utrinque rotundatis, medio leniter constrictis, levibus, castaneis, $30-36 \times 18-20 \mu$; pedicello hyalino, brevi, deciduo.

On leaves of *Gerbera plantaginea*, Garstfontein, Pretoria District (Miss J. Erasmus), 3:5:1913. (Pole Evans, 6599.) At same locality (P. J. Pienaar), 3:3:1915. (Pole Evans, 8887.) Plate XLVI, fig. 6.

HELICHRYSUM Gaertn.

5. *Puccinia Kalchbrenneri* De Toni.

Uredo lepisclinis Thuem. in Mycoth. Univ. n. 1644.

Puccinia helichrysi Kalchbr. and Cke. Grevillea ix, p. 21.

Puccinia Kalchbrenneri De Toni. Sacc. Syll. vii, p. 645; Sydow, Monogr. i, p. 93, f. 83.

Uredospores.—Sori mostly hypophyllous, spots indistinct, often confluent, of variable size and diverse colour, scattered or subgregarious, minute, at first covered, convex, firm, finally free, ochraceous; spores globose, subglobose or ellipsoid, verruculose, yellow, $20-30 \times 19-26 \mu$.

Teleutospores.—Sori hypophyllous, on the same spots, scattered or

gregarious, minute, brown; spores oblong or subclavate, thickened at the apex, attenuated or rarely truncate, constricted at the middle, smooth obscurely brown, $40-57 \times 15-22 \mu$, rarely up to 27μ broad; pedicel coloured, short, deciduous.

On leaves of *H. quinquerive*, Barberton, Transvaal (I. B. Pole Evans), 4:2:1911. (Pole Evans, 1158.)

On leaves of *Helichrysum* sp., Paardeplaats, Lydenburg District (P. J. Pienaar), 2:5:1911. (Pole Evans, 1491.)

On leaves of *Helichrysum quinquerive*, Barberton, Transvaal (I. B. Pole Evans), 29:8:1911. (Pole Evans, 1860.)

On leaves of *Helichrysum quinquerive*, Eshowe, Zululand (I. B. Pole Evans), 30:1:1912. (Pole Evans, 2026.) Plate XLVI, fig. 7.

This fungus was first collected by MacOwan at Somerset East on *Helichrysum petiolatum* in 1879. This material has not been examined by the author. Sydow states that the pedicels are hyaline; in the majority of specimens that I have examined they are distinctly coloured.

6. *Puccinia MacOwani* Wint.

Aecidium truncatum Kalchbr. in herb.

Puccinia MacOwani Wint. Hedw., 1885, p. 255; Sydow, Monogr. i, p. 93, f. 82.

Aecidiospores.—*Aecidia* hypophyllous, on orbicular spots about 2 mm. diam., yellowish or brownish, often confluent, solitary or more often deposited loosely in groups of 2-10, white, elongated, closed at first then open, with an erect incised margin; spores angular-globose, verrucose, subhyaline, $23-32 \mu$ diam.

Uredospores.—Sori amphigenous, scattered or in groups of 2-5, of medium size, rounded, long, covered by the epidermis, yellowish-brown; spores globose, subglobose, or ellipsoid, echinulate, yellowish-brown, $18-24 \times 24-27 \mu$.

Teleutospores.—Sori hypophyllous or amphigenous, often mingled with the *aecidia*; spots similar, scattered or frequently a few aggregated, rotund, minute, $\frac{1}{2}$ -1 mm. diam., pulverulent, fuscous-brownish; spores elongated, subclavate or broadly fusiform, attenuated at both ends, strongly thickened (up to 9μ) at the apex, slightly constricted at the middle, smooth, light brown, $45-60 \times 18-27 \mu$; pedicel thick, persistent, hyaline, equal in length to the spore or shorter than it.

On leaves of:

Helichrysum petiolatum, Boschberg, Somerset East (MacOwan), July, 1877.

Helichrysum sp., Belfast, Transvaal (E. M. Doidge), February, 1909. (Pole Evans, 554.)

Helichrysum sp., Pretoria (E. M. Doidge), May, 1909. (Pole Evans, 683.)

Helichrysum sp., Lydenburg, Transvaal (P. J. Pienaar), 25:1:1911. (Pole Evans, 1072.)

Helichrysum sp., Garstfontein, Pretoria District (P. J. Pienaar), 26:3:1911. (Pole Evans, 1269.)

Helichrysum sp., Garstfontein, Pretoria District (P. J. Pienaar), 8:4:1911. (Pole Evans, 1421.)

Helichrysum sp., Garstfontein, Pretoria District (Miss J. Erasmus), 13:4:1911. (Pole Evans, 1430.)

Helichrysum sp., Paardeplaats, Lydenburg District (P. J. Pienaar), 2:5:1911. (Pole Evans, 1492.)

Helichrysum sp., Garstfontein, Pretoria District (Miss J. Erasmus), 15:1:1912. (Pole Evans, 2082.) Plate XLVII, fig. 8.

The aecidia are rarely seen in the Transvaal, and their place would appear to be taken by uredospores, which occur commonly on Transvaal material, and which have not hitherto been recorded for this species.

7. *Puccinia Pienarii* Pole Evans, n.sp.

Aecidiis amphigenis in villo nidulantibus, solitariis vel gregariis, pallidis, margine laciniato; aecidiosporis angulato-globosis vel ellipsoideis, subtiliter verruculosis, subhyalinis, $21-30 \times 15-22 \mu$; soris teleutosporiferis amphigenis, sine maculis, saepe aecidiis immixtis, sparsis vel gregariis, rotundatis, ca. 1 mm. diam. primo tomento folii tectis, dein nudis, pulverulentis, brunneo-atris; teleutosporis difformibus, ellipsoideis vel oblongis, apice rotundatis vel truncatis, medio parum constrictis, basi plerumque rotundatis, ad marginem irregulariter incrassatis (usque 7μ), flavo-brunneis, levibus, $33-48 \times 18-27 \mu$; pedicello hyalino, brevi, caduco.

On leaves of *Helichrysum* sp. Paardeplaats, Lydenburg District (P. J. Pienaar), 2:4:1911. (Pole Evans, 1489.) Plate XLVII, fig. 9.

This species is remarkable for the irregularly thickened walls of the teleutospores. In some cases the walls might well be described as being flanged.

Aecidiospores.—Aecidia amphigenous embedded in pubescence, solitary or gregarious, pallid, with a lacinate margin; spores angular-globose or ellipsoid, delicately verruculose, subhyaline, $21-30 \times 15-22 \mu$.

Teleutospores.—Sori amphigenous, without spots, often mingled with the aecidia, scattered or gregarious, rotund, about 1 mm. diam., at first covered by the leaf pubescence, afterwards exposed, pulverulent, brownish black; spores of unusual shape, ellipsoid or oblong, rounded at the apex or truncated, usually a little constricted at the middle, mostly rounded at the base, irregularly thickened at the margins (up to 7μ), yellowish-brown, smooth, $33-48 \times 18-27 \mu$; pedicel hyaline, short, caducous.

HYPOCHOERIS L.

8. *Puccinia Hypochoeridis* Oud.

Uredo lysoeridis Schum. Pl. Saell. ii, p. 233 (1801).

Puccinia Hypochoeridis Oud. in Nederl. Kruidk. Archief. ii, ser. 1, p. 175 (1873); Sydow, Monogr. i, 100; Fischer, Ured. Schweiz., p. 232; McAlpine, Rusts of Australia, p. 159, f. 62-3; Grove, The British Rust Fungi, p. 148-9, f. 100-1.

Uredospores.—Sori amphigenous or often caulicolous, generally forming minute spots, scattered, pulverulent, cinnamon, primary of medium size, secondary minute; spores globose, subglobose, or ellipsoid, echinulate, pale brown, 22-28 μ diam., with two germ pores.

Teleutospores.—Sori amphigenous, often caulicolous, scattered, pulvini-form, black; spores ellipsoid or ovate-ellipsoid rounded at both ends, rarely attenuated, not thickened, not or scarcely constricted at the middle, delicately verruculose, brown, 30-46 \times 18-24 μ ; epispore thin; pedicel short, hyaline.

On *Hypochoeridis radicata*, Newlands, Cape Town (H. H. W. Pearson), 12:11:1912. (Pole Evans, 5595.) Plate XLVII, fig. 10.

Europe, Siberia, North America, Chili, Australia.

Grove *l.c.*, p. 149, states: "The alleged punctations of the teleutospores were invisible in all the specimens I have seen." These are, I find, clearly visible in the Cape Town material.

PRINTZIA Cass.

9. *Puccinia Printziae* Thuem.

Puccinia Printziae Thuem. in Myc. Univ. n. 742; Sacc. Syll. vii, p. 704; Sydow, Monogr. i, p. 137-8, f. 118.

Teleutospores.—Sori hypophyllous, scattered, forming round yellowish-fuscous spots, minute, but often spreading into larger ones, verruciform, pulvinate, firm, date-brown-chestnut; spores oblong or subclavate, rounded at the apex or attenuated, strongly thickened (up to 12 μ), constricted at the middle, attenuated below, smooth, light brown, 40-65 \times 16-22 μ ; pedicel hyaline, persistent, thick, up to 55 μ long.

On leaves of *Printzia Huttoni*, near Somerset East (MacOwan, 1278). (Pole Evans, No. 8846.) Plate XLVII, fig. 11. Material kindly supplied to me by the Director of the South African Museum, Cape Town.

SENECIO L.

10. *Puccinia aecidiiformis* Thuem.

Puccinia aecidiiformis Thuem. on Flora, 1875, p. 378, and 1880, p. 318; Sacc. Syll. vii, p. 704; Sydow, Monogr. i, p. 128, f. 108.

Teleutospores.—Sori hypophyllous or caulicolous, scattered or gregarious, on orbicular yellow spots, of medium size, often confluent on the stem, ochraceous, compact; spores oblong, rounded at the apex or attenuated, thickened above (up to $8\ \mu$), slightly constricted at the middle, attenuated below, smooth, pale yellow or subhyaline, $52-75 \times 20-28\ \mu$; pedicel hyaline, deciduous, up to $38\ \mu$ long.

On leaves and stem of (*Nidorella mespilifolia*) *Senecio deltoidis* D.C., in Boschberg Mountains, autumn 1875. (MacOwan, 1105; Pole Evans, 8845.) Plate XLVIII, fig. 12.

I am indebted to the Director of the South African Museum, Cape Town, for material of this species, and also for allowing me to examine the Museum sheets of this fungus.

The host was originally regarded as *Nidorella mespilifolia*, but it has since been determined as *Senecio deltoidis* D.C.

11. *Puccinia oedipus* Cke.

Puccinia oedipus Cke. in Grevillea x, p. 126; Sacc. Syll. vii, p. 608; Sydow, Monogr. i, p. 143, f. 122.

Uredospores.—Sori hypophyllous, minute, scattered, fuscous; spores globose, echinulate, yellow-brownish, $30-38\ \mu$ diam.

Teleutospores.—Sori hypophyllous, scattered, minute, black-brownish, pulverulent; spores broadly ellipsoid or oblong-ellipsoid, rounded at both ends, thickened at the apex (up to $11\ \mu$), slightly constricted at the middle, somewhat smooth, a beautiful chestnut, $50-54 \times 27-35\ \mu$, pedicel hyaline, persistent, thick, sometimes twisted, up to $90\ \mu$ long, often inserted obliquely.

On leaves of *Senecio pandurifolia*, Inanda, Natal. (J. Medley Wood, 561.) May, 1881. (Pole Evans, 369.) Plate XLVIII, fig. 13.

SPILANTHES L.

12. *Puccinia africana* Cke.

Puccinia africana Cke. in Grevillea viii, p. 71 (1879); Sacc. Syll. vii, p. 706; Sydow, Monogr. i, p. 156, f. 132.

Teleutospores.—Sori hypophyllous, forming minute green spots, scattered or deposited circinately, minute, compact, black-brown; spores clavate or fusiform, rounded at the apex or narrowed, thickened (up to $8\ \mu$), constricted at the middle, attenuated at the base, smooth, light brown, $43-58 \times 14-19\ \mu$, pedicel hyaline shorter than the spore.

On leaves of *Spilanthes acmella* Kentani (Pegler, 1922), 19:11:1913. (Pole Evans, 7088.) Plate XLVIII, fig. 14.

VERNONIA Schreb.13. *Puccinia vernoniicola* P. Henn.

Puccinia vernoniicola P. Henn., in Engler Oostafrikan Pflanzenwelt, p. 50 (1895); Sacc. Syll. xiv, p. 317; Sydow, Monogr. i, p. 177, f. 155.

Teleutospores.—Sori hypophyllous, spots dark, absent or rudimentary, scattered, round, $2-2\frac{1}{2}$ mm. diam., pulvinate, ochraceous; spores club-shaped, rounded at the apex, not thickened, slightly constricted at the middle, attenuated at the base, smooth, hyaline-yellow, $45-70 \times 20-27 \mu$, epispore very thin; pedicel hyaline, thick, persistent, up to 100μ long.

On leaves of *Vernonia angulifolia*, Table Mountain Location, Natal (C. Fuller), 18:5:1911. (Pole Evans, 1618.) Winkle Spruit, Natal, 6:8:1912. (Pole Evans, 2498.) Plate XLIX, fig. 15.

This fungus was first recorded in 1895 on a *Vernonia* from Tropical East Africa at Marangu.

14. *Puccinia inflorescenticola* Pole Evans, n.sp.

Soris teleutosporiferis in inflorescentibus evolutis et maxime hypertrophico-deformatis insidentibus, nigris, confluentibus, irregularibus, bullas fusiformes et gallaeformes usque 3-4 cm. longas efformantibus; teleutosporis cylindricis cylindrico-clavatis vel fusiformibus, apice plerumque rotundatis vel interdum acutiusculis, valde incrassatis (usque 9μ), medio leniter constrictis, basi attenuatis, levibus, flavobrunneis, $40-60 \times 18-22 \mu$; pedicello colorato, crasso, persistenti, usque 63μ longo.

Hab. in inflorescentibus *Vernoniae* sp., Rosehaugh, Transvaal (T. R. Sim), 3:6:1914. (Pole Evans, 7802.) Plate XLIX, fig. 16.