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MISCELLANEOUS PUBLICATION 27

DISEASES OF THE OPIUM POPPY (PAPAVER SOMNIFERUM): A CHECK LIST (U)

William C. Harrison

Chris G. Schmitt

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(U) FOREWORD

(U) This check list of diseases of *Papaver somniferum* L., the opium poppy, was compiled from files made available by Dr. Paul Miller of the Pathology Section of the Agricultural Research Service and from literature available in the National Agricultural Library.

(U) The opium poppy is commonly cultivated in Europe and numerous other areas for its seed and narcotic products. It is found infrequently in licensed plantings in this country; because little of the crop is cultivated here, the literature on diseases of this host are mainly of foreign origin.

(U) ABSTRACT

(U) This check list of diseases of *Papaver somniferum* L., the opium poppy, includes two bacterial, two viral, and more than 50 fungal diseases. Five species of nematodes that have been reported on poppy roots also are included.

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I. (U) BACTERIA

Erwinia aroideae (Townsend) Holland. Soft rot (shoots and stems). Japan.[1]

Syn. Bacterium papaveris (Ayyar) Burgvitz.

Erwinia papaveris (Ayyar) Magrou.

Xanthomonas papavericola (Br. & McWhorter) Dowson. Bacterial leaf blight. USA,[2] Bulgaria.[3]

Syn. Bacterium papavericola Br. & McWhorter.

II. (U) FUNGI

Alternaria brassicae (Berk.) Sacc. var. somniferi Br. & Har. Leaf spot (on capsules). Bulgaria,[4,5] Germany,[6] USSR,[7] India,[8] Japan.[9]

Syn. Alternaria papaveris Sawada.

Alternaria somniferi Br. and Har.

Alternaria brunnea Sawada. Leaf spot (on flowers and capsules). Formosa.[10]

Alternaria Nees ex Wallr. sp. Leaf spot. Italy,[11] Palestine.[12]

Aregma moniliforme ? (= Phragmidium Link sp., perfect stage). Rust. India.[13]

Ascochyta Lib. sp. Leaf spot. USSR.[14]

Cercospora papavericola Chupp. Leaf spot. Formosa.[10]

Cladosporium herbarum (Pers.) Fr. [= Mycosphaerella tulasnei (Jancz.) Lindau, perfect stage]. Leaf spot. Bulgaria,[4,5] India,[13] USSR.[15]

Corticium solani (Prill. & Delacr.) Bourd. & Galz. See Rhizoctonia solani.

Dacryomyces papaveris Quel. India.[8]

Dactylium roseum ? [= Hypomyces (Fr.) Tul. sp., perfect stage]. Leaf spot. India.[13]

Dendryphium papaveris Sawada. Leaf spot. Formosa.[10]

[illegible] (Cda.) Fr. [= [illegible] calvescens (Fr.) [illegible] perfect stage]. Leaf spot. Germany,[illegible] Netherlands,[36] Czechoslovakia,[illegible] Switzerland.[38]

[illegible] (Cda.) Fr. var. [illegible] Meffert. Leaf spot. Germany.[illegible]

[illegible] Schroet. Leaf smut. Germany,[6] India,[8] Rumania,[20] Hungary,[illegible] Cyprus,[illegible] Turkey,[illegible] Yugoslavia,[25] Argentina,[26] Formosa (British).[27]

Entyloma de Bary sp. Leaf smut. Italy.[28]

Erysiphe herbarum Cda. Leaf spot (dots). India.[8]

Erysiphe cichoracearum DC. Powdery mildew. India,[29] USSR,[30,31] Formosa.[32]

Erysiphe cerasunis (Wallr.) Link. Powdery mildew. Finland,[33] USSR.[34]

Erysiphe polygoni DC. Powdery mildew. USA,[2] Germany,[6] India,[29] Argentina,[35,36] Switzerland.[37]

Erysiphe tabaci Sawada. Powdery mildew. Formosa.[38]

Fusarium scirpi Lamb. & Fautr. var. caudatum Wr. Spots. Bulgaria.[4,39]

Fusarium Link ex Fr. sp. Spots. Bulgaria,[4] Palestine.[12]

Gloeosporium Desm. & Mont. sp. Spots. Japan.[40]

Helminthosporium papaveris Sawada. [= Pleospora calvescens (Fr.) Tul., perfect stage]. Damping off. India,[8] Germany,[39] Poland,[41] Bulgaria,[4,41,42] Denmark,[43] Formosa,[44] France,[45] Japan,[44,46] USSR,[47] Yugoslavia,[48,49] Czechoslovakia,[50] Switzerland,[51] Austria.[52]

See also Pleospora calvescens for synonyms.

Helminthosporium Link ex Fr. sp. Leaf spot. Palestine.[12]

Heterosporium echinulatum (Berk.) Cke. (= Didymellina dianthi Burt., perfect stage). Spots. Rare. Bulgaria.[4]

Heterosporium groenlandicum Allesch. Spots. USSR.[34,53]

Macrophoma papaveris Da Camara. Leaf spot. Portugal.[54]

Macrosporium bresadolae Parisi. Leaf spot. Bulgaria,[4] Italy,[55,56] Germany,[57] Japan,[58,59] USSR.[54]

Syn. Macrosporium papaveris Bres.

Macrosporium somniferi Garbowski.

Macrosporium Fr. sp. Leaf spot. Italy.[11]

Mucor mucedo (L.) Link. Mold. Rare. Bulgaria,[4] India.[13]

Mycosphaerella tulasnei (Jancz.) Lindau. See Cladosporium herbarum.

Oidium erysiphoides Fr. Imperfect powdery mildew. USSR.[34,60]

Ophiobolus sativus (P. & K.B.) Ito & Kuribayashi. Rot disease. Bulgaria.[4]

Pellicularia filamentosa (Pat.) Rogers. See Rhizoctonia solani.

Syn. Corticium solani (Prill. & Delacr.) Bourd. & Galz.

Corticium vagum B. & C. var. solani Burt.

Penicillium Link ex Fr. sp. Common mold. Rare. Bulgaria.[4]

Peronospora arborescens L. Downy mildew. India,[8,13,29,61] Czechoslovakia,[17,61] Switzerland,[17,61] Denmark,[61] Finland,[61] France,[61] Hungary,[61] Iran,[61] Italy,[61] Norway,[61] Poland,[61] Sweden,[61] Argentina,[61,62] Austria,[61,63] Bulgaria,[4,64] China,[65] Egypt,[61,64,66] England,[61,67,68] Ireland,[68] Germany,[6,61,69,70] Japan,[46,61,71,72] Macedonia,[73] Netherlands,[61,74,75] Romania,[61,76,77] Scotland,[68,78] Spain,[79] Uruguay,[80,81] USSR,[61,82-86] Yugoslovia.[87-89]

Phelipea indica ? India.[13]

Phoma melaena (Fr.) M. & D. Blight. India,[8] Hungary.[90]

Phoma morphaea Sacc. Blight. India,[8] Italy.[91]

Phoma striaeformis D. & M. var. hysteriola Sacc. Blight. India,[8] Italy,[92] France.[93]

Pleospora calvescens (Fr.) Tul. See Helminthosporium papaveris.

Syn. Pleospora papaveracea (De Not) Sacc.

Pleospora pellita (Fr.) Rabh.

[illegible] Messl. Leaf spot. India.[8]

[illegible] (Fr.) Sacc. See [illegible].

[illegible] (Fr.) Sacc. Leaf spot. India.[8] Switzerland.[51]

[illegible] Trow. Seedling blight. Australia.[94]

Rhizoctonia solani Kuehn [= Pellicularia filamentosa (Pat.) Rogers, perfect stage]. Damping off. USA,[illegible] India.[illegible] See Pellicularia filamentosa for synonyms.

Rhizoctonia DC ex Fr. sp. Damping off. India.[96]

Rhizomorpha Roth ex Fr. sp. India.[13]

Rhizopus Ehrenb. ex Corda sp. Rot. Rare. Bulgaria.[4]

Sclerotinia libertiana Fuckel. See Sclerotinia sclerotiorum.

Sclerotinia sclerotiorum (Lib.) de Bary. Blight. USSR.[97]

Syn. Sclerotinia libertiana Fuckel.

Sclerotinia Fuckel sp. Blight. Rare. Bulgaria.[4]

Sclerotium rolfsii Sacc. [= Pellicularia rolfsii (Curzi) West, perfect stage]. Crown rot. India.[29]

Sphaerella morphaea Sacc. Leaf spot. India.[8]

Sporotrichum Link ex Fr. sp. Leaf spot. India.[13]

Stachylidium Link ex Fr. sp. Leaf spot. Italy.[11]

Trichoderma viride Pers. ex Gray. Mold rot. India.[13]

Trichothecium roseum Link ex Fr. Fruit rot. Rare. Bulgaria.[4]

Trichothecium Link ex Fr. sp. Fruit rot. Italy.[11]

III. (U) VIRUSES

Cabbage black ringspot virus. ? England,[98] South Africa.[99]

Leaf curl virus. ? India.[18]

[illegible]

[illegible] (Corno) Cooley. See Meloidogyne sp.

[illegible] Schmidt. Sugar beet nematode. Germany.[6]

[illegible] sp. Root-knot nematodes. USA,[2] Palestine,[12] Israel.[illegible]

Syn. [illegible] (Corno) Cooley.

[illegible] penetrans (Cobb) Filipjev. & Stekhoven. Meadow nematode. Netherlands.[illegible]

Syn. Tylenchus penetrans Cobb.

Pratylenchus Filipjev. sp. Meadow nematode. Netherlands.[101]

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LITERATURE CITED

1. Takimoto, S. 1935. A soft rot of opium poppy. La Bulteno Sci. Fak. Terkultura Kjusu Imp. Univ. 6:4:306-311.

2. Crops Res. Div., Agriculture Research Service. 1960. Index of plant diseases in the United States. Agriculture Handbook No. 165, U.S. Department of Agriculture, Washington, D.C.

3. Christoff, A. 1931. Einige fur Bulgarien neue Pflanzenkrankheiten. Sviedienia Zemledelieto 11:11/12:3-16.

4. Christoff, A. 1943. Fungi causing spots on the balls and molding the seed of opium poppy. Spisanie Zemedel. Opitni Inst. Bulgaria 13:1/2:13-19.

5. Savoff, Chr. 1922. Zur Bekampfung von Cladosporium herbarum und Alternaria brassicae auf den Getreidearten. Rev. Inst. Rech. Agron. Bulgarie 2:5/6:407-419.

6. von Kirchner, O. 1923. Die Krankheiten und Beschadigungen unserer landwirtschaftlichen Kulturpilanzen, p. 308-310. 3rd ed. Verlagsbuchhandlung von Eugen Ulmer in Stuttgart, Olgastrasse 83, Germany.

7. Smarods, J. 1955. Parskats par latvijas psr nepilnigi pazistamajam senem: II. Melankonialium; III. Hifomicetali. [A survey of imperfect fungi of Latvia SSR: II. Melanconiales; III. Hyphomycetales (Report III)]. Latvijas Psr Zinatnu Akad. Vestis 8:97:93-105.

8. Butler, E.J. 1917. Botany: Part III. Mycology, p. 103-113. Annual Report of the Board of Scientific Advice for India for the Year 1915-1916.

9. Sawada, K. 1958. Researches on fungi in the Tohoku District of Japan: IV. Fungi Imperfecti. Japan Forest. Exp. Sta. Bull. 105:35-140.

10. Sawada, K. 1959. Descriptive catalogue of Taiwan (Formosan) fungi: XI. College of Agriculture, Nat. Taiwan Univ. (Taipei) Special Publication 8:1-268.

11. Petri, L. 1942. Rassegna dei casi fitopatologici osservati nel 1942. Boll. Sta. Patol. Vegetale (Rome) 22:197-244.

12. Reichert, I. 1940. Diseases of industrial and medicinal plants. Int. Bull. Plant Protect. 14:4:77M-78M.

13. Asthana, S.N. 1954. The cultivation of the opium poppy in India. Bulletin on Narcotics (India). 10 p.

14. Sruoga, K. 1931. Kai kurie parazitiniai grybeliai, surinkti Lietuvoje 1922-1932. Dotnuva, Lithuania, Zemes Ukio Akad. Metraštis 1932 M:199-208.

15. Sokin, A.D. 1924. Diseases of cultivated plants observed in the Vlatka government during the summer of 1922. Tr. Chetvertogo Vseros. Entomol. Fitopathol. S'ezd. Moskva Dec. 8-14, 1922:108-115.

16. Poeteren, N., van. 1929. Verslag over de werkzaamheden van den Plantenziektenkundigen Dienst in het jaar 1927. (Report on the activities of the Phytopathological Service in the year 1927). Verslag. Mededel. Plantenziektenkundigen Dienst Wageningen 55:93 p.

17. Seda, A. 1935. Boj proti chorobam skuducum domacich olejnych rostlin. Cazove Otazky Zemedel. 45:87-108.

18. Zogg, H. 1945. Die Blattdurre des Mohns [Pyrenophora calvescens (Fr.) Sacc.], Nebenfruchtform Dendryphium penicillatum (Cda.) (Fr.). Bull. Soc. Bot. Suisse 55:240-269.

19. Meffert, M.E. 1950. Ein Beitrag zur Biologie und Morphologie der Erreger der parasitaren Blattdurre des Mohns. Z. Parasitenk. 14:442-498.

20. Savulescu, Tr. 1935. Contributions a la connaissance des Ustilaginees de Roumanie. Anal. Inst. Cercet. Agron. Rom. 7:6:347-430.

21. Greschik, V. 1890. Champignons de la Hongrie. Rev. Mycol. 12:112.

22. Petrak, F. 1941. Schedae ad Cryptogamas exsiccatae, editae a museo historiae naturalis Vindobonensi. Ann. Naturhist. Mus. Wien 51:347-373.

23. Georghiou, G.P.; Papadopoulos, Chr. 1957. A second list of Cyprus fungi. Cyprus Dep. Agr., Tech. Bull. 5:1-38.

24. Bremer, H.; Ismen, H.; Karel, G.; Ozkan, H.; Ozkan, M. 1947. Beitrage zur Kenntnis der parasitischen Pilze der Turkei II. Rev. Fac. Sci. Fac. Sci. Univ. Istanbul Ser. B 12:4:307-334.

25. Lindtner, V. 1950. Gare Jugoslavije (Ustilaginales Jugoslavije). (Smuts of Yugoslavia). Belgrade Bull. Mus. Hist. Natur. Pays Serbe Ser. B 3/4:5-110.

26. Marchionatta, J.B. 1923. Contribucion al conocimiento de los hongos parasitos de las plantas cultivadas. Rev. Fac. Agron. (Argentina) 15:2:83-92.

27. Waterston, J.M. 1939. Annotated list of diseases of cultivated plants in Bermuda. Dep. Agr. Bull. (Bermuda) No. 18:24.

[illegible] Bull. [illegible] 26:1-14.

[illegible] The Indian [illegible], Dehra Dun, India. 552 p.

[illegible] 1935. Beitrage zur Kenntnis der Erysiphaceen Litauens. [illegible], Lithuania, [illegible] 4:2:63-99.

[illegible] 1925. Diseases of cultivated plants in Middle Asia. Turkestan Plant Protection Sta., Phytopathol. Sect., Tashkent. 165 p. Rev. Appl. Mycol. 5:174-175.

32. Sawada, K. 1922. Descriptive catalogue of the Formosan fungi: Part II. Dep. Agr. Government Res. Inst. (Formosa) Rep. 2:1-175.

33. Rachela, A. 1958. Erysiphaceae in Finnia inventae et distributio earum hucusque cognita. Karstenia 4:14-26.

34. Potebnia, A. 1907. Mycologische Studien. Ann. Mycol. 5:1:1-28.

35. Hauman-Merck, L. 1915. Les parasites vegetaux des plantes cultivees en Argentine et dans les regions Limitrophes. Anal. Museo Nac. Hist. Natur. Buenos Aires 26:163-225.

36. Hauman-Merck, L.; Parodi, R. 1921. Los parasitos vegetales de las plantas cultivadas en la Republica Argentina. Rev. Fac. Agron. Veterinaria 3:3:227-274.

37. Mayer, E. 1921. Notes mycologiques. Bull. Soc. Neuchateloise Sci. Natur. 46:3-40.

38. Sawada, K. 1928. Descriptive catalogue of the Formosan fungi: Part IV. Dep. Agr. Government Res. Inst. (Formosa) Rep. 35.1-123.

39. Christoff, A. 1934. Some plant diseases new for Bulgaria. Bull. Soc. Bot. Bulgarie 6:37-48.

40. Hemmi, T. 1920. Beitrage zur Kenntnis der Morphologie und Physiologie der Japanischen Gloeosporien. J. Coll. Agr. Hokkaido Imp. Univ. (Japan) 9:1.1-159.

41. Barbacka, K. 1937. Helminthosporium na maku uprawnym (Helminthosporium papaveri K. Sawada). Panstwowego Inst. Nauk. Gosp. Wiejskiego W Pulawach, Pamietnik 16:1:73-86.

42. Christoff, A. 1930. The Pleospora disease of cultivated poppy. Sofia Printing Office Government, Bulgaria. 99 p.

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43. [illegible], 1937. [illegible] fra [illegible] Museum [illegible] Rep. Phytopathol. Lab. [illegible], [illegible], Copenhagen 1936 to 1937 No. 2:3-11.

44. Tanaka, T. 1930. New Japanese fungi: Notes and translations IX. Mycologia 12:329-333.

45. Duron, P. 1937. Sur quelques Pleospora d' Auvergne. Bull. Trim. Soc. Mycol. France 53:2:169-174.

46. Ishiyama, T. 1936. List of the fungi parasitic on agricultural plants in Southern Sakhalin. J. Sapporo Soc. (Agriculture and Forestry) 28:131: 20.

47. Petrak, F. 1921. Beitrage zur Pilzflora von Mahren und Osterr-Schlesien. Ann. Mycol. 19:5/6:273-295.

48. Kispatic, J. 1950. Prilog poznavanju parasitske mikoflore Hrvatske. Hrvatsko Prirodoslovno Drustvo, Glasnik Bioloske Sekcije 2B:2/3:44-50.

49. Milatovic, I. 1952. Prilog poznavanju gljive Pleospora calvescens (Fr) Tulasne na maku. Poljodjelska Znanstvena Smotra 13:121-132.

50. Weese, J. 1925. Eumycetes selecti exsiccati: 9. Lieferung No. 201-225. Mitt. Bot. Inst. Tech. Hochsch. Wein 2:1:17-26.

51. Cruchet, D. 1923. Recherches mycologiques a montagny et aux environs d' yverdon. Bull. Soc. Vaudoise Sci. Natur. 55:212:155-177.

52. Keissler, C. 1925. Schedae ad "Kryptogamas exsiccatae," editae a Museo historiae Naturalis Vindobonensis. Ann. Naturhist. Mus. Wein 38:134-149.

53. Alekseev, A. 1927. Materialien zur Pilzflora der Tatarischen Republic. Izv. Kazansk. Inst. Sel'sk. Khoz. i Les. 1:60-97.

54. Da Camara, E. 1930. Contributiones ad mycoflora Lusitaniae. An. Inst. Super. Agron. 3:59-141.

55. Parisi, R. 1924. Contribuzione alla micologia dell'Italia meridionale. Boll. Orto Bot. Univ. Napoli 7:35-66.

56. Parisi, R. 1921. Di alcuni parassiti delle plante medicinali e da essenze. Rev. Patol. Vegetale 11:1/2:1-16.

57. Bresadola, G. 1915. Neue Pilze aus Sachsen. Ann. Mycol. 13:104-106.

58. Ishiyama, T. 1936. New or noteworthy fungi parasitic on agricultural plants in southern Sakhalin. Trans. Sapporo Natur. Hist. Soc. 14:4:297-308.

[illegible]. [illegible] Bull. Trim. Soc. [illegible] 33:3/4:73-91.

[illegible]. [illegible] 1948. Vorläufige Mitteilung über die Erforschung der Krankheiten der Agrarpflanzen und der technischen Kulturen im Nord-Kaukasus. North Caucasian Plant Protect. Sta. Bull. 4:30-46.

61. Gustavsson, A. 1959. Studies on Nordic Peronosporae: I. Taxonomic revision. Opera Bot. Soc. Bot. Lundensi 3.1.1-271.

62. Lindquist, J.C. 1939. Especies argentinas del genero Peronospora. Physis (Buenos Aires) 15.47:13-20.

63. Prochaska, M. 1928. Beobachtungen uber das Auftreten von Peronospora arborescens (Falscher Meltau) auf Papaver somniferum. Fortschr. Landwirt. (Wien) 3.165-167.

64. Briton-Jones, H.R. 1925. Mycological work in Egypt during the period 1920-1922. Ministry of Agriculture, Egypt, Techn. Sci. Serv. Bull. 49:1-129.

65. Tai, F.L. 1936. A list of fungi hitherto known from China. The Sci. Rep. Nat. Tsing Hua Univ., Series B No. 2:137-165.

66. Melchers, L.E. 1931. A checklist of plant diseases and fungi occurring in Egypt. Trans. Kansas Acad. Sci. 34:41-106.

67. Gaumann, E. 1923. Beitraege zu einer Monographie der Gattung Peronospora Corda. Beitr. Kryptogamenflora Schweiz 5:4:1-360.

68. Cotton, A.D. 1929. Fungous diseases of Meconopsis. Gard. Chron. 85.143-144.

69. Jaap, O. 1922. Weitere Beitraege zur Pilzflora von Triglitz in der Prignitz. Verhandl. Bot. Ver. Prov. Brandenburg 64:1-60.

70. Hruby, J. 1929. Beitraege zur Pilzflora Mahrens und Schlesiens. Hedwigia 69:3/4:173-213.

71. Matsumura, J. 1904. Index plantarum japonicarum. Enumeratio Plantarum Omnium, Cryptogamae, Tokioni. 439 p.

72. Hennings, P. 1903. Fungi japonici III. Bot. Jahrbucher Syst. Pflanzengeschichte Pflanzengeographie A. Engler 32:34-46.

73. Ranojevic, N. 1938. Beitrag zur Pilzflora Mazedoniens. Hedwigia 77 5/6:233-242.

UNCLASSIFIED

74. [illegible], C.A.J.A. 1935. Catalogue raisonné des Champignons des Pays-Bas. Verhandel. Koninklijke Akad. Wetensch. Amsterdam 11:1-599.

75. [illegible], N., [illegible]. 1923. Verslag over de werkzaamheden van den Plantenziektenkundigen Dienst in het jaar 1922. Plantenziekten-kundigen Dienst Wageningen 21:57 p.

76. [illegible], C.V.; Sadulescu, I.M. 1933. Peronosporacees recoltes dans la depression de la Riviere Jijia II. Ann. Sci. Univ. Jassy 18:423-442.

77. Savulescu, Tr. 1948. Les especes de Peronospora Corda de Roumanie. Sydowia Ann. Mycol. 2:255-307.

78. Dennis, R.W.G.; Fetcher, C.E. 1942. List of diseases of economic plants recorded in Scotland. Trans. Brit. Mycol. Soc. 25:266-306.

79. Losa Espana, D.M. 1944. Aportaciones a la flora micologica gallega. Anal. Jardin Bot. Madrid 4:195-240.

80. Koch de Brotos, L.; Boasso, C. 1955. Lista de las enfermedades de los vegetales en el Uruguay. Uruguay Dir. Agron. Publ. 106:5.

81. Montoro Guarch, A. 1935. Contribucion Fitopatologica 1935. Rev. Fac. Agron. Montevideo (Uruguay) 11:9-24.

82. Bondarzev, A.S. 1903. Fungous parasites of cultivated and wild plants collected in the vicinity of Riga during the summer of 1902. Bull. Jard. Imp. Bot. St. Petersbourg 3:177-200.

83. Lobik, A.I. 1914. Parasice Pilze, gesammelt im Sommer 1912-13 im kreise Chola des Gouv. Pskow. Bolezni Rast. 8:2/3:74-89.

84. Naoumoff, M.N. 1914. Materieux pour la flore mycologique de la Russie Fungi ussuriensis I. Bull. Soc. Mycol. France 30:62-83.

85. Dobrovolski, M.E. 1914. Observations of the parasitic fungi of the Podolsk government. J. Plant Dis. 4/5:139-146.

86. Girzitska, Z. 1929. Materials to the mycoflora of Ukrana. Bull. Jard. Bot. Kieff 9:92-101.

87. Yossifovitch, M. 1930. Peronospora arborescens (Berk) de Bary, un grave parasite du Papaver somniferum. Compt. Rend. Acad. Agr. France 15:29:1010.

88. Yossifovitch, M. 1928. Kingdom of the Serbs, Croats, and Slovenes: A destructive disease of the poppy in southern Serbia. Int. Bull. Plant Prot. 2:2:18-19.

UNCLASSIFIED

[illegible]

[illegible] de la Charente, recoltes en 1886-98 par M. [illegible]. Rev. Mycol. 11:29-33.

91. Saccardo, P.A. [illegible]-1882. Fungi venetiae novi vel critici u. mycologiae venetae [illegible]. Michelia 2:154-175,241-291,377-383,528-563.

92. Saccardo, P.A. [illegible]-1882. Fungi galliici lecti a cl. viris P. Brunaud, Abb. Letendre, A. Malbranche, J. Therry vel editi in mycotheca gallica C. Roumeguéri. Michelia 2:39-135,362-371,583-648.

93. Brunaud, P. 1890. Sphaeropsidées recoltées jusqu'a ce jour dans la Charente-inferieure. Acad. Rochelle, Soc. Sci. Natur. Charente-Inferieure, Ann. 1889 No. 26.51-140.

94. Angell, H.R. 1936. Seedling blight: II. Soil in relation to seedling blight of opium poppy and peas. Australian J. Agr. Res. 1.132-140.

95. Uppal, B.N.; Patel, M.K.; Kamat, M.N. 1935. The fungi of Bombay. Dep. Agr. (Bombay) Bull. 176:1-56.

96. Butler, E.J. 1918. Fungi and diseases of plants, p. 344-346. Thacker, Spink and Co., Calcutta, India.

97. Kalymbetov, B.K. 1959. Material for a sac-fungus flora of Zailiisk Alatau. Akad. Nauk Kaz. SSR Inst. Bot. Tr. 7:268-338.

98. Hamlyn, R.M.G. 1953. Quantitative studies on the transmission of cabbage black ring-spot virus by Lygus pratensis (Sulz.). Ann. Appl. Biol. 40:2:393-402.

99. Doidge, E.M.; Bottomley, A.M.; van der Plank, J.E.; Pauer, G.D. 1953. A revised list of plant diseases in South Africa. S. African Dep. Agr. Sci. Bull. 346:1-122.

100. Minz, G. 1953. Plant parasitic nematodes. Ministry of Agriculture, Agricultural Research Station, Rehovot, Israel. 38 p. Also, Biol. Abstr. 28:9563, 1954.

101. Besemer, A.F.H.; Oostenbrink, M. 1955. Phytotoxische en nematicide werking van grondontsmettingen met DD. Ghent Landbouwhogeschool Mededel. 20:3:282-283.

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13. ABSTRACT

(U) This check list of diseases of Papaver somniferum L., the opium poppy, includes two bacterial, two viral, and more than 50 fungal diseases. Five species of nematodes that have been reported on poppy roots also are included.

14. Key Words

*Diseases
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Fungi
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*Poppy

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