

AN ANNOTATED LIST OF *PYTHIUM* IN TAIWAN^(1,2)HUANN-JU HSIEH⁽³⁾

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Pythium spp. are widely distributed in Taiwan. The author has conducted study on this genus of fungi since June, 1974 and some species which are new for Taiwan were reported in previous paper (Hsieh & Chang, 1976). This paper presents an annotated list of species of *Pythium* and their habitats in Taiwan. These fungi were isolated from soil and plant roots were collected from various locations in Taiwan. Every isolate in this study was obtained from cutting the single hyphal tip. Identification of these fungi were based on the monographs presented by Matthews (1931), Middleton (1943) and Waterhouse (1967, 1968).

As shown in the list, 27 species of *Pythium* have been recognized in Taiwan. Among them 14 species isolated and identified by the author are new for Taiwan. They are *P. adhaerens* Sparrow, *P. carolinianum* Matthews, *P. dissotocum* Drechsler, *P. elongatum* Matthews, *P. gracile* Schenk., *P. helicandrum* Drechsler, *P. irregulare* Buisman, *P. marsipium* Drechsler, *P. parocandrum* Drechsler, *P. pulchrum* von Minden, *P. splendens* Braun, *P. tardicrescens* Vanterpool, *P. undulatum* Petersen and *P. ultimum* Trow. The common species of *Pythium* in Taiwan are *P. spinosum*, *P. dissotocum*, *P. irregulare* and *P. aphanidermatum*.

List of **PYTHIUM** in Taiwan1. *Pythium acanthicum* Drechsler,

Jour. Wash. Acad. Sci. 20: 398-418. 1930.

Habitat: Soil. (Hsieh, 1976)

Saccharum officinarum L. (Watanabe, 1974)

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Note: Watanabe (1974) described one species complex, *Pythium acanthicum*—*Pythium oligandrum* complex, from sugarcane root. But the author agrees with Drechsler (1930, 1939, 1946) that these two species can be distinguished by their different characteristics of oogonial spines, antheridia and oospores (plerotic or aplerotic), etc.

2. ***Pythium adhaerens*** Sparrow,

Ann. Bot. 65: 257-277. 1931.

Habitat: Soil. (Hsieh, 1976)

Note: This species is a new record in Taiwan.

3. ***Pythium afertile*** Kanouse and Humphrey,

Papers Mich. Acad. Sci. Arts and Letters 8: 129-140. 1927.

Habitat: *Oryza sativum* L. (Hsieh & Chang, 1976)

Saccharum officinarum L. (Watanabe, 1974)

Soil. (Hsieh & Chang, 1976)

4. ***Pythium aphanidermatum*** (Edson) Fitzpatrick,

Jour. Agr. Res. 4: 279-292. 1915.

Habitat: *Capsicum frutescens* L. (Sawada, 1943)

Cucumis sativus L. (Sawada, 1943)

Diospyros kaki Thunb. (Sawada, 1943)

Nicotiana tabacum L. (Kusumoto, 1942)

Phaseolus aureus R. (Hsieh, 1976)

Phaseolus vulgaris L. (Sawada, 1943)

Pinus luchuensis Mayr. (Chen *et al.*, 1969)

Saccharum officinarum L. (Hsu & Chu, 1962)

Solanum melongena L. (Sawada, 1943)

Solanum tuberosum L. (Sawada, 1943)

Soil. (Hsieh, 1976)

5. ***Pythium arrhenomanes*** Drechsler,

Phytopathology 18: 873-875. 1928.

Habitat: *Oryza sativa* L. (Hsieh, 1976)

Soil. (Hsieh, 1976)

Saccharum officinarum L. (Hsu & Chu, 1962)

6. ***Pythium carolinianum*** Matthews,

Studies on the genus *Pythium*. 1931.

Habitat: Soil. (Hsieh, unpublished)

Note: This species is a new record in Taiwan.

7. ***Pythium catenulatum*** Matthews,
Studies on the genus *Pythium*. 1931.
Habitat: *Saccharum officinarum* L. (Hsu, 1965)
Soil. (Hsieh, 1976)
8. ***Pythium debaryanum*** Hesse,
Inaugr. Dissert. Halle. 14-34. 1874.
Habitat: *Cucumis melo* L. (Sawada, 1943)
Cunninghamia lanceolata (Lamb.) Hook. (Chen, 1962)
Pinus ellioti Engelm. (Jong & Chen, 1966)
9. ***Pythium dissotocum*** Drechsler,
Jour. Wash. Acad. 20: 389-418. 1930.
Habitat: *Citrus* spp. (Hsieh, unpublished)
Oryza sativa L. (Hsieh, 1976)
Soil. (Hsieh & Chang, 1976)
Water (Hsieh, 1976)
Note: This species is a new record in Taiwan.
10. ***Pythium elongatum*** Matthews,
Studies on the genus *Pythium*. Univ. N. Carolina Press 1931.
Habitat: *Oryza sativa* L. (Hsieh & Chang, 1976)
Note: This species is a new record in Taiwan.
11. ***Pythium gracile*** Schenk,
Verhandl. Phys.-Med. Ges. Wurzburg 9: 12-31. 1859.
Habitat: Soil. (Hsieh & Chang, 1976)
Note: This species is a new record in Taiwan.
12. ***Pythium graminicolum*** Subramaniam,
Agr. Res. Inst. Pusa (India). Bull. 177: 1-7. 1928.
Habitat: Soil. (Hsieh, 1976)
Saccharum officinarum L. (Watanabe, 1974)
13. ***Pythium helicandrum*** Drechsler,
Bull. Torrey Bot. Club 77: 455-459. 1950.
Habitat: Soil. (Hsieh, unpublished)
Note: This species is a new record in Taiwan.
14. ***Pythium hydno sporum*** (Mont. apud Berk) Schroeter,
de Bary: Abh. Senckenb. Naturforsch. Ges. 12: 19. 1897.
Habitat: *Boehmeria nivea* Hook et Arn. (Sawada, 1927)

Note: This species was described by Sawada in 1927, but I haven't observed it.

15. **Pythium irregulare** Buisman,

Med. Phytopath. Lab. 11: 1-51. 1927.

Habitat: *Cryptomeria japonica* D. (Hsieh, 1976)

Soil. (Hsieh & Chang, 1976)

Note: This species is a new record in Taiwan.

16. **Pythium mamillatum** Meurs,

Wortelrot, Veroorzaakt door Schimmels uit de Geslachten *Pythium* Pringsheim en *Aphanomyces* de Bary 1-94. 1928.

Habitat: *Saccharum officinarum* L. (Hsu & Liu, 1966)

Soil. (Hsieh, unpublished)

17. **Pythium marsipium** Drechsler,

Phytopathology 31: 478-507. 1941.

Habitat: Soil. (Hsieh & Chang, 1976)

Note: This species is a new record in Taiwan.

18. **Pythium myriotylum** Drechsler,

Jour. Wash. Acad. 20: 398-418. 1930.

Habitat: *Arachis hypogaea* L. (Jan & Wu, 1972)

Irrigation water in rice field (Hsieh, unpublished)

Nicotiana tabacum L. (Liu, 1976)

Zingiber officinale Rescoe (Lin, *et al.*, 1971)

19. **Pythium oligandrum** Drechsler,

Jour. Wash. Acad. Sci. 20: 393-418. 1930.

Habitat: *Saccharum officinarum* L. (Watanabe, 1974)

Soil. (Hsieh, 1976)

Notes: See *Pythium acanthicum*.

20. **Pythium paroecandrum** Drechsler,

Jour. Wash. Acad. Sci. 20: 398-418. 1930.

Habitat: Soil. (Hsieh, unpublished)

Note: This species is a new record in Taiwan.

21. **Pythium pulchrum** von Minden,

Mykol. Untersuch. Ber, R. Falck 1: 146-255. 1916.

Habitat: Soil. (Hsieh, 1976)

Note: This species is a new record in Taiwan.

22. *Pythium spinosum* Sawada,

Jour. Nat. Hist. Soc. Formosa 16: 199-212 1926.

Habitat: *Allium fistulosum* L. (Sawada, 1931; Sawada & Chen, 1926)

Allium schaeenoprasum L. (Sawada, 1931; Sawada & Chen, 1926)

Antirrhinum majus L. (Sawada, 1931; Sawada & Chen, 1926)

Arctium lappa L. (Sawada, 1931)

Brassica campestris L. (Sawada, 1931; Sawada & Chen, 1926)

Calendula officinalis L. (Sawada, 1931)

Campanula medium L. (Sawada, 1931)

Chrysanthemum coronarum L. (Sawada, 1931; Sawada & Chen, 1926)

Coriandrum sativum L. (Sawada, 1931)

Cucumis sativus L. (Sawada, 1931; Sawada & Chen, 1926)

Daucus carota L. (Sawada, 1931; Sawada & Chen, 1926)

Dianthus chinensis L. (Sawada & Chen, 1926)

Eleocharis plantaginea R. Br. var. *tuberosa* Makino (Phytopathological Lab., 1955)

Hordeum vulgare L. (Hsieh, 1976)

Ipomea reptans Poir. (Lo, 1961)

Lactuca sativa L. (Sawada, 1931; Sawada & Chen, 1926)

Lycopersicon esculentum Mill. (Sawada, 1931)

Oryza sativa L. (Hsieh, 1976)

Phaseolus aureus Roxb. (Hsieh, 1976)

Pinus luchuensis Mayr, (Chen, *et al.*, 1969)

Raphanus sativus L. (Sawada, 1931; Sawada & Chen, 1926)

Soil. (Hsieh, 1976)

Solanum melongena L. (Sawada & Chen, 1926)

Zinnia elegans Jacq. (Sawada, 1931)

23. *Pythium splendens* Braun,

Jour. Agr. Res. 30: 1043-1062 1925.

Habitat: Soil. (Hsieh, unpublished)

Note: This species is a new record in Taiwan.

24. *Pythium tardicrescens* Vanterpool,

Ann. Appl. Biol. 25: 528-543. 1938.

Habitat: Soil. (Hsieh, 1976)

Note: This species is a new record in Taiwan.

25. *Pythium undulatum* Petersen,

Bot. Tidssk. 29: 345-440 1909.

Habitat: Soil. (Hsieh, unpublished)

Note: This species is a new record in Taiwan.

26. *Pythium ultimum* Trow,

Ann. Bot. 15: 269-312. 1901.

Habitat: Soils. (Hsieh, unpublished)

Note: This species is a new record in Taiwan.

27. *Pythium vexans* de Bary,

Jour. Bot. 14: 105-126. 1876.

Pinus luchuensis Mayr. (Chen *et al.*, 1969)

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臺灣產猝倒病菌之目錄

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筆者自 1974年 6 月起，調查研究本省產之猝倒病菌屬 (*Pythium*) 菌類。本文僅列出臺灣產之猝倒病菌共 27 種之目錄及寄主範圍和習性，其中有 14 種為臺灣之新記錄。