

# STUDIES OF PLANT AND SOIL NEMATODES. 7. QUEENSLAND RECORDS OF THE ORDER TYLENCHIDA AND THE GENERA TRICHODORUS AND XIPHINEMA.

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## SUMMARY

One hundred and five nematode species, including many important plant pathogens, are reported from Queensland.

The records are presented in two sections. In the first the nematode species are arranged in alphabetical order with information on associated plants and localities; in the second the plant species are arranged in similar order with lists of associated nematodes.

## I. INTRODUCTION

Nematodes have been important pests of Queensland crops since the beginnings of agriculture in the State. Bancroft (1879) reported that root-knot nematodes, which he referred to as "flask worms", were responsible for colonists abandoning farmlands in south-eastern Queensland. As host plants he mentioned *Solanum nigrum*, *Sida rhombifolia*, banana, broad bean, grape, most culinary vegetables and many weeds, even those growing in virgin ground. He described and illustrated root-knot of banana, which he considered was responsible for Panama disease (Figure 1).

Tryon (1903) reported that *Heterodera* and *Tylenchus* (now *Meloidogyne* species and *Radopholus similis* (Cobb) respectively) were found in banana roots at Cairns and were responsible for "constitutional derangement involving the fruit".

Colbran (1953, 1954, 1955, 1956, 1960a, 1960b, 1961, 1962, 1963, and in Colbran and Saunders 1961) described 11 new species of Tylenchida and one new species of *Trichodorus* from Queensland and reported the occurrence of a number of other species. This author (1958) listed Queensland host records of root-knot nematodes (*Meloidogyne* species). As a complementary paper, additional records only of these species have been included.

## II. MATERIALS AND METHODS

Nematodes were obtained from plant and soil samples collected by the writer and other officers of the Queensland Department of Primary Industries or submitted by farmers for examination. After extraction, these were relaxed by gentle heat, fixed in F.A.A., and processed by standard lactophenol or glycerine methods before being mounted in martius yellow/cotton blue lactophenol or anhydrous glycerine respectively.

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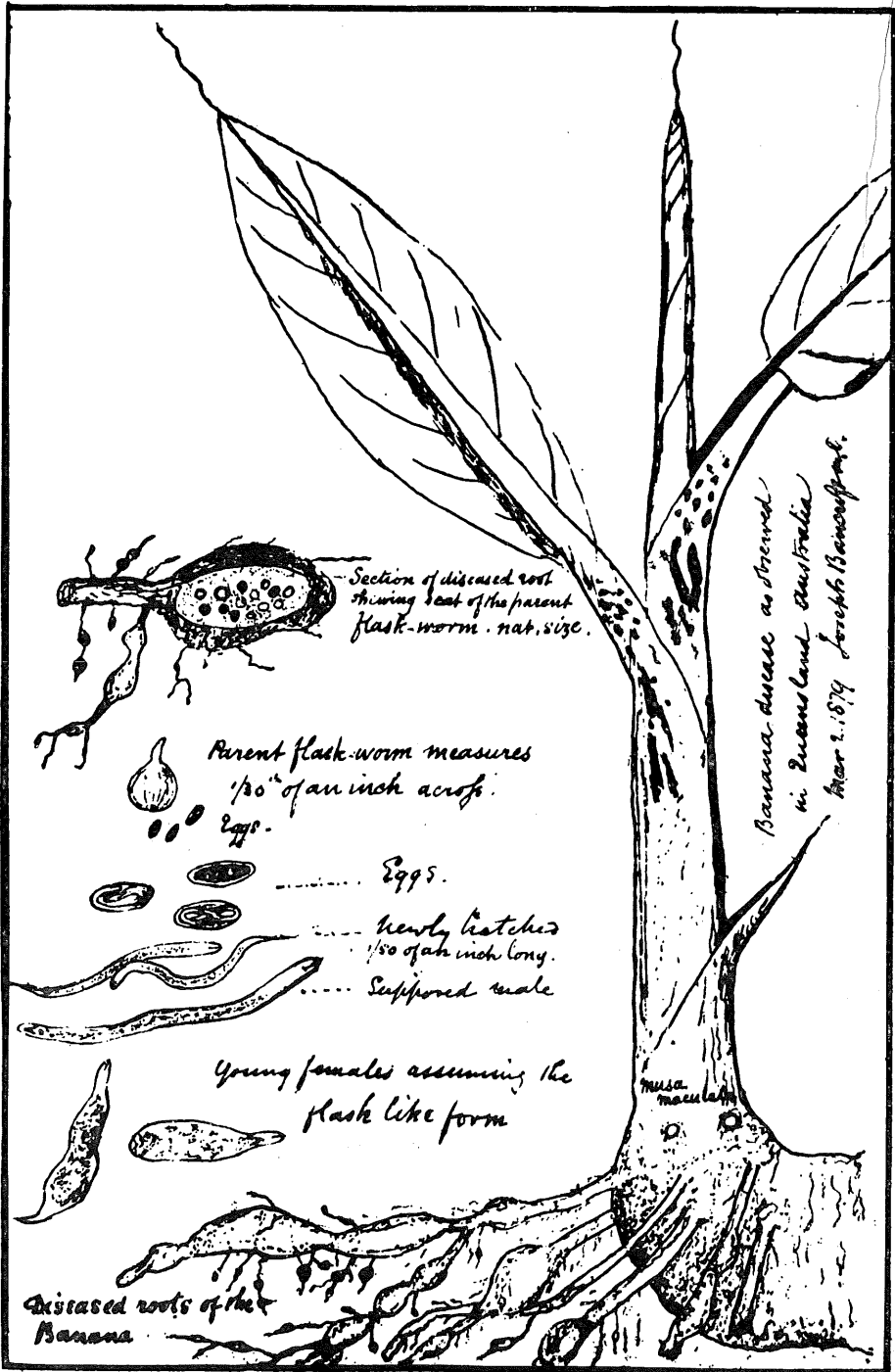


Fig. 1.—Root-knot of banana (After Bancroft 1879).

### III. PRESENTATION OF DATA

Records are presented in two sections. In the first, nematode species are arranged in alphabetical order with the lists of the plants with which they were associated, localities and occasional comments; in the second, plant species are arranged in alphabetical order with lists of associated nematode species.

The association of a nematode and plant does not imply that the species is a parasite. When parasitism has been observed it is indicated by x (field conditions) or G (greenhouse conditions). Apart from the parasites of spermaphytes, some species reported in this paper are fungivorous and other are predatory on other nematodes.

Synonymy has been included when considered necessary.

#### SECTION 1

##### Nematode/Associated Plant List

##### ANGUINA Scopoli

(Seed gall nematodes)

##### *Anguina agrostis* (Steinbuch)

(Bent grass nematode)

Galls in seed of *Agrostis tenuis* Sibth. (browntop bent grass) from New Zealand. No infestation has been observed in the field.

##### *Anguina microlaenae* (Fawcett)\*

Galls on the leaves and inflorescences of *Astrebala pectinata* (Lindl.) F. Muell. ex Benth. (barley Mitchell grass), "Tandara", via Morella. (Figure 2.)



Fig. 2.—Galls on barley Mitchell grass caused by *Anguina microlaenae*.

\* Or a closely related undescribed species.

**APHELENCHOIDES** Fisher**Aphelenchoides bicaudatus** (Imamura)

Soil. Brisbane, Kennedy, Montville, Stanthorpe, Yeppoon.

*A. bicaudatus* has been observed to reproduce on fungal cultures.

**Aphelenchoides coffeae** (Zimmerman)

Soil. Applethorpe, Ayr, Ballandean, Brisbane, Buderim, Coolum, Cooroy, Inglewood, Ipswich, Koongal, Mapleton, Nambour, Rockhampton, Tolga, Yandina, Yeppoon.

*A. coffeae* has been observed to reproduce on fungal cultures.

**Aphelenchoides composticola** Franklin

Soil. Brisbane, Ballandean, Biloela, Bouldercombe, Glen Aplin, Redland Bay, Yelarbon, Yeppoon.

**Aphelenchoides ritzema-bosi** (Schwartz)

(*Chrysanthemum foliar* nematode)

*Chrysanthemum morifolium* Ramat. *Chrysanthemum*. Brisbane, Rockhampton, Toowoomba.

**Aphelenchoides saprophilus** Franklin

Soil. Brisbane, Inglewood, Thulimbah, Toowoomba, Yelarbon.

**Aphelenchoides subtenuis** (Cobb)

*Portulaca oleracea* L. Pigweed. Applethorpe.

**APHELENCHUS** Bastian**Aphelenchus avenae** Bastian

*A. avenae* is a very common fungivore present in soil throughout Queensland and is frequently observed reproducing on fungal cultures.

**BASIRIA** Siddiqi**Basiria graminophila** Siddiqi

*Chrysanthemum morifolium* Ramat. *Chrysanthemum*. Brisbane (Botanic Gardens).

**BOLEODORUS** Thorne**Boleodorus thylactus** Thorne

*Panicum maximum* Jacq. Guinea grass. Brisbane.

*Pinus elliottii* Engelm. Slash pine. Beerwah (Coochin logging area).

*Vitis vinifera* L. Grape. Texas.

**Boleodorus volutus** Lima and Siddiqi

*Melastoma polyanthum* Blume. Blue tongue. Coolum.

**CRICONEMA** Hofmanner and Menzel

(Ring nematodes)

**Criconema australe** Colbran*Citrus sinensis* Osbeck. Sweet orange. Mundubbera.*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Wynnum Bowling Green).*Imperata cylindrica* (L.) Beauv. var. *major* (Nees) C. E. Hubbard. Blady grass. Brisbane (Long Pocket).*Medicago sativa* L. Lucerne. Brisbane (Moggill).

Soil. Hills overlooking Harwood (New South Wales).

**Criconema civellae** Steiner*Citrus limon* (L.) Burm. f. Rough lemon. Burrum, Mundubbera.**Criconema octangulare** (Cobb) Taylor*Hodgkinsonia frutescens* C. T. White. Tolga.**Criconema pectinatum** Colbran*Ananas comosus* (L.) Merr. Pineapple. Elimbah.*Pinus elliottii* Engelm. Slash pine. Beerwah.**CRICONEMOIDES** Taylor

(Ring nematodes)

**Criconemoides demani** (Micoletzky)

Soil. Cunningham's Gap.

**Criconemoides limitaneum** (Luc)*Hodgkinsonia frutescens* C. T. White. Tolga.**Criconemoides macrodorum** Taylor*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Mt. Nebo.**Criconemoides mutabile** Taylor*Carica papaya* L. Papaw. Brisbane (Sunnybank).*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Rocklea).*Musa* sp. Banana variety (cultivar) Williams Hybrid. Brisbane (Rochdale).

Soil. Mt. Glorious.

**Criconemoides ornatum** Raski*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Elimbah, Glasshouse Mountains, Mutanee, Woombye.*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt).

*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Sunnybank Bowling Green).

*Hornstedtia scottiana* (F. Muell.) K. Schum. A wild ginger. Junction of Palmerston Highway and Henderson Drive, North Queensland.

**Criconemoides peruense** (Steiner)

Soil. Elimbah.

**Criconemoides xenoplax** Raski

*Vitis vinifera* L. Grape. Glen Aplin.

**DELADENUS** Thorne

**Deladenus durus** (Cobb)

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Byrnestown, Gayndah.

*Musa* sp. Banana variety (cultivar) Williams Hybrid. Nambour.

*D. durus* was observed to reproduce on a culture of *Fusarium* sp. from a gladiolus corm.

**DITYLENCHUS** Filipjev

**Ditylenchus myceliophagus** J. B. Goodey

Soil. Clump Point, Dalby, Didillibah, Elimbah.

**DOLICHODORUS**

(Awl nematodes)

**Dolichodorus obtusus** Allen

*Gahnia clarkei* Benl. Burrum.

**ECPHYADOPHORA** de Man

**Ecphyadophora tenuissima** de Man

Soil. Applethorpe, Beerwah, Burrum, Cunningham's Gap, Rosemount, Harwood (New South Wales), Windsor (New South Wales).

**FERGUSOBIA** (Currie)

**Fergusobia tumefaciens** (Currie)

Associated with the fly *Fergusonina brimblecombei* Tonnoir on:

x *Eucalyptus crebra* F. Muell. Narrow-leaved ironbark. Forest Hill.

x *Eucalyptus hemiphloia* F. Muell. ex Benth. Gum-topped box. Forest Hill.

x *Eucalyptus melanophloia* F. Muell. Silver-leaf ironbark. Forest Hill.

Associated with *Fergusonina tillyardi* Tonnoir on:

x *Eucalyptus tereticornis* Sm. Blue gum. Redland Bay.

Associated with *Fergusonina* sp. on:

x *Angophora costata* (Gaertn.) Domin. Rusty gum. Yarraman. (Figure 3).



Fig. 3.—Galls on the leaves of *Angophora costata* caused by *Fergusonobia tumefaciens* in association with flies of the genus *Fergusonina*.

- x *Angophora subvelutina* F. Muell. Broad-leaved apple. Yarraman.
- x *Eucalyptus acmenioides* Schau. Yellow stringybark. Brisbane (Toowong).
- x *Eucalyptus drepanophylla* F. Muell. ex Benth. Grey ironbark.
- x *Eucalyptus intermedia* F. Muell. Pink bloodwood. Redland Bay.
- x *Eucalyptus populnea* F. Muell. Poplar box. Barakula.
- x *Eucalyptus tessellaris* F. Muell. Moreton Bay ash. Forest Hill.

#### GRACILIACUS Raski

##### *Graciliacus peperpotti* Schoemaker

*Pinus elliotii* Engelm. Slash pine. Beerwah.

#### HELICOTYLENCHUS Steiner

(Spiral nematodes)

##### *Helicotylenchus dihystra* (Cobb)

*Syn. Helicotylenchus nannus* Steiner

This is one of the most common tylenchs in Queensland soils.

- Ananas comosus* (L.) Merr. Pineapple. Amamoor, Bauple, Beerwah, Bowen, Brisbane (Acacia Ridge), Dayboro, Didillibah, Dundowran, Elimbah, Flaxton, Innisfail, Kallangur, Kandanga, Montville, Nikenbah, Palmwoods, Rosemount, Tewantin, Woombye. Although large numbers of *H. dihystera* are a common feature of pineapple soils, unpublished data from field trials indicate that the association has little effect on plant growth.
- Annona squamosa* (L.). Custard apple. Yeppoon.
- Araucaria cunninghamii* D. Don. Hoop Pine. Danbulla.
- Asclepias fruticosa* L. Narrow-leaf cotton bush. Nambour.
- x *Avena sativa* L. Oats. Beerwah.
- Bauhinia* sp. Rockhampton.
- Beta vulgaris* L. var. *cicla* L. Silver beet. Frenchville.
- Beta vulgaris* L. var. *vulgaris*. Beetroot. Mt. Isa, Victoria Point, Yeppoon.
- Brassica oleracea* L. var. *capitata* L. Cabbage. Brisbane (Eight Mile Plains).
- Cajanus cajan* (L.) Millsp. Pigeon pea. Nambour.
- Carica papaya* L. Papaw. Yeppoon.
- Centrosema pubescens* Benth. Centro. Nambour.
- Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt, Pullenvale), Burrum Chevallum, Clump Point, Gayndah, Kennedy, Koah, Palmwoods, Pennant Hills (New South Wales).
- Coleus blumei* Benth. Coleus. Koongal.
- Cucumis melo* L. var. *reticulatus* Naud. Rockmelon. Brisbane (Manly).
- Cucumis sativus* L. Cucumber. Brisbane.
- Cyclamen persicum* Mill. Cyclamen. Brisbane (Northgate).
- Daucus carota* L. Carrot. Mt. Ninderry.
- Dianthus caryophyllus* L. Carnation. Brisbane (Rochedale), Wallangarra.
- x *Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Sunnybank Bowling Green).
- x *Dolichos lablab* L. Tonga or hyacinth bean. Beerwah.
- Fragaria X ananassa* Duchesne. Strawberry. Beerwah, Frenchville, Nambour, Ormiston, Gosford (New South Wales).
- Gerbera jamesonii* Bolus. Gerbera. Brisbane.
- G *Hordeum vulgare* L. Barley.
- Hornstedtia* sp. A wild ginger. Junction of Palmerston Highway and Henderson Drive (North Queensland).
- Imperata cylindrica* (L.) Beauv. var. *major* (Nees) C. E. Hubbard. Blady grass. Nambour.
- Lactuca sativa* L. Lettuce. Biloela, Brisbane (Everton Park).
- Lantana camara* L. Lantana. Kabra.
- x *Lotononis bainesii* Bak. Nambour.
- Lupinus angustifolius* L. New Zealand blue lupin. Tolga.
- Lycopersicon esculentum* Mill. Tomato. Ballandean, Gracemere, Kabra, Ormiston, Yeppoon.
- Macadamia tetraphylla* L.A.S. Johnson. A Macadamia or Queensland nut. Nambour.



- Medicago sativa* L. Lucerne. Brisbane (Moggill), Jimboomba, Kairi.  
*Melinis minutiflora* Beauv. Molasses grass.
- x *Musa* spp. Banana varieties (cultivars) Cavendish, Lady Finger and Williams Hybrid. Brisbane (Rochedale, The Gap), Buderim, Bundaberg, Currumbin, Glasshouse Mountains, Maryborough, Mt. Mee, Nambour, Narangba, Pimpama, Tully, Woongoolba.  
*H. dihystra* produces small surface necroses on banana roots.  
*Opuntia* sp. A prickly pear. Mulambin Beach.  
*Paspalum dilatatum* Poir. Paspalum. Miriam Vale.  
*Passiflora edulis* Sims forma *edulis*. Passionfruit. Bundaberg, Mapleton.  
*Petunia X hybrida* Vilm. Petunia. Rockhampton.
- x *Phaseolus atropurpureus* DC. Siratro. Nambour.  
*Phaseolus vulgaris* L. French bean. Frenchville.  
*Pisum sativum* L. Garden Pea. Brisbane, Montville.  
*Plantago major* L. Large plantain. Stanthorpe.  
*Prunus persica* (L.) Batsch, var. *nectarina* Maxim. Nectarine. Penrith (New South Wales).  
*Saccharum officinarum* L. Sugar cane. Bundaberg, Coolum, Mossman.  
*Secale cereale* L. Rye. Beerwah.  
*Solanum tuberosum* L. Potato. Beerwah.
- x *Sorghum bicolor* (L.) Moench. Sweet sorghum. Beerwah.  
x *Sorghum sudanense* (Piper) Stapf. Sudan grass. Nambour.  
x *Stizolobium* spp. Velvet beans. Nambour.  
*Tapeinocheilos queenslandiae* (F.M. Bail.) K. Schum. Junction of Palmerston Highway and Henderson Drive (North Queensland).
- x *Trifolium repens* L. White clover. Brisbane (Mt. Gravatt), Cooroy, Kenilworth, Maleny, Pomona, Redbank.
- x *Triticum aestivum* L. Wheat. Cobba-da-manna.  
*Vitis vinifera* L. Grape. Coominya, Severnlea, Warwick.
- x *Zea mays* L. Maize. Beerwah, Nambour.  
Soil. Highvale, Ravenshoe, Samsonvale, Harwood (New South Wales).

***Helicotylenchus erythrinae* (Zimmerman)**

*Pilidostigma tropicum* L.S. Smith. Tolga.  
Soil. Tully.

***Helicotylenchus multicinctus* (Cobb)**

*Ananas comosus* (L.) Merr. Pineapple. Kallangur.  
*Musa banksii* F. Muell. A wild banana. Near Bookal-Bookal Creek four miles north of Tully.  
*Musa hillii* F. Muell. A wild banana. Bailey's Creek (North Queensland).  
*Musa* spp. Banana varieties (cultivars) Cavendish, Lady Finger, Williams Hybrid. Brisbane (Brookfield), Bundaberg, Nambour, Pinalba, Tully, Victoria Point, Wamuran, Yeppoon.  
Soil. Beerwah, Rockhampton.

**HEMICRICONEMOIDES** Chitwood and Birchfield**Hemicriconemoides brachyurus** (Loos)

*Casuarina equisetifolia* L. Dune sheoak. Mulambin Beach.

**Hemicriconemoides chitwoodi** Esser

*Opuntia* sp. A prickly pear. Mulambin Beach.

**Hemicriconemoides cocophillus** (Loos)

*Casuarina equisetifolia* L. Dune sheoak. Burrum Heads.

*Citrus sinensis* Osbeck. Sweet orange. Mundubbera.

**Hemicriconemoides mangiferae** Siddiqi

*Ananas comosus* (L.) Merr. Pineapple. Bowen.

**Hemicriconemoides obtusus** Colbran

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Didillibah.

*Casuarina equisetifolia* L. Dune sheoak. Burrum Heads.

*Saccharum officinarum* L. Sugar cane. Bundaberg.

*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Mt. Nebo.

**HEMICYCLIOPHORA** de Man

(Sheath nematodes)

**Hemicycliophora labiata** Colbran

*Casuarina equisetifolia* L. Dune sheoak. Burrum Heads.

*Entolasia stricta* (R.Br.) Hughes. Brisbane (Oxley).

*Medicago sativa* L. Lucerne. Brisbane (Moggill).

*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Mt. Nebo.

Soil. Mulambin Beach, hills overlooking Harwood (New South Wales).

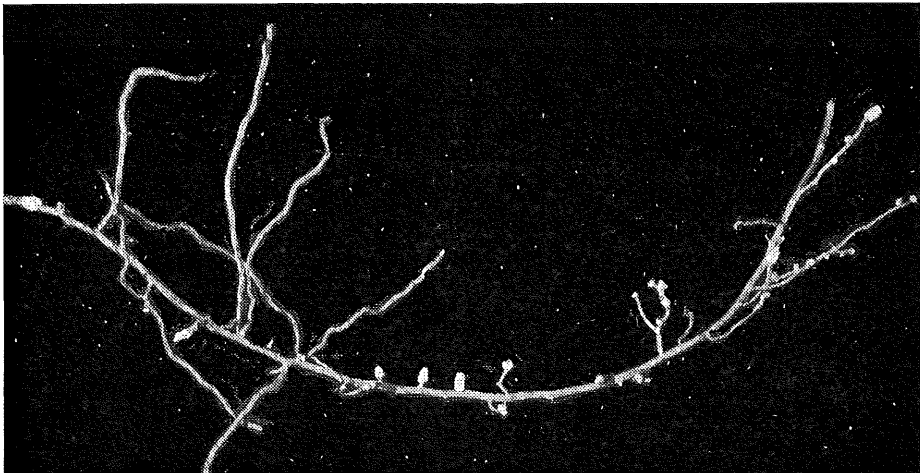


Fig. 4.—Galls on the roots of rough lemon caused by *Hemicycliophora nudata*.

**Hemicycliophora nudata** Colbran

x *Citrus limon* (L.) Burm. f. Rough lemon. Burrum.

G *Citrus reticulata* Blanco. Mandarin varieties (cultivars) Emperor and Cleopatra.

G *Citrus sinensis* Osbeck. Sweet orange.

*Gahnia clarkei* Benl. Burrum.

Soil. Hills overlooking Harwood (New South Wales).

*H. nudata* feeds on the root tips of citrus, producing conspicuous galls (Figure 4). Under glasshouse conditions it has caused severe injury to the root tips of *Capsicum frutescens* L. (capsicum, variety California Wonder) (Figure 5).



Fig. 5.—Capsicum with roots injured by *Hemicycliophora nudata*.

**Hemicycliophora ovata** Colbran

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Cooroy, Glasshouse Mountains.

*Musa* sp. Banana variety (cultivar) Williams Hybrid. Tully.  
Soil. Harwood (New South Wales).

**Hemicycliophora truncata** Colbran

*Ananas comosus* (L.) Merr. Pineapple. Elimbah, Eumundi, Mooloolah, North Arm, Woombye.

*Casuarina littoralis* Salisb. Black sheoak. Eudlo (Jawarra Park).

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt).

*Eucalyptus pilularis* Sm. Blackbutt. Fraser Is.

*Lycopersicon esculentum* Mill. Tomato. Stanthorpe (Bald Mountain).

*Prunus persica* (L.) Batsch. Peach. Ballandean.

*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Mt. Nebo.

*Vitis vinifera* L. Grape. Glen Aplin.

Soil. Brisbane (Rochedale), hills overlooking Harwood and Maclean (New South Wales).

**HETERODERA** Schmidt

(Cyst nematodes)

**Heterodera schachtii** Schmidt

(Sugar-beet nematode)

x *Beta vulgaris* L. var. *vulgaris*. Beetroot. Lawes.

x *Brassica napobrassica* (L.) Mill. Swede turnip. Lawes.

x *Brassica oleracea* L. var. *capitata* L. Cabbage. Lawes.

**Heterodera trifolii** Goffart

(Clover cyst nematode)

x *Trifolium repens* (L.) White clover. Maleny.

Light infestations of *H. trifolii* have been found on two farms.

**MELOIDOGYNE** Goeldi

(Root-knot nematodes)

Additions to Queensland host records of *Meloidogyne* species (Colbran 1958).

**Meloidogyne arenaria thamesi** Chitwood

x *Brassica oleracea* L. var. *capitata* L. Cabbage. Moderate. Brisbane (Eight Mile Plains).

x *Calopogonium mucunoides* Desv. Calopo. Heavy. South Johnstone.

x *Nicotiana tabacum* L. Tobacco. Heavy. Bundaberg.

x *Phaseolus vulgaris* L. French bean. Heavy. Boulia.

**Meloidogyne hapla** Chitwood

- x *Arachis hypogaea* L. Peanut. Moderate. Tingoora.  
 G *Crotalaria goreensis* Guill. & Perr. Gambia pea. Light.  
 x *Dolichos lablab* L. Tonga or hyacinth bean. Heavy. Thornlands.  
 x *Lotononis bainesii* Bak. Heavy (nodules); light (roots). Mt. Mee.  
 x *Persea americana* Mill. Avocado. Light. Nambour, Palmwoods, Redland Bay.  
 x *Plantago major* L. Large plantain. Light. Brisbane (Newmarket).  
 x *Rosa multiflora* Thunb. Heavy. Brisbane (Rochedale), Lawnton.  
 G *Stylosanthes gracilis* H.B.K. Stylo. Moderate.  
 G *Trifolium baccarinii* Chiov. Light.  
 G *Trifolium burchellianum* Ser. ex DC. Cape clover. Light.  
 G *Trifolium glomeratum* L. Clustered clover. Light.  
 G *Trifolium hybridum* L. Alsike clover. Light.  
 x *Trifolium repens* L. White clover. Moderate. Lawes, Maleny, Pomona.  
 G *Trifolium rueppellianum* Fresen. Heavy.  
 G *Trifolium semipilosum* Fresen. Light.

**Meloidogyne incognita** (Kofoid and White)

Syn. *Meloidogyne incognita* var. *acrita* Chitwood

- G *Centella asiatica* (L.) Urb. Pennyweed. Moderate.  
 x *Chenopodium album* L. Fat hen. Light. Lawes.  
 x *Clerodendrum splendens* G. Don. A clerodendrum. Heavy. Brisbane (Toowong).  
 x *Dianthus caryophyllus* L. Carnation. Heavy. Brisbane.  
 x *Dolichos lablab* L. Tonga or hyacinth bean. Heavy. Kairi.  
 x *Hibiscus schizopetalus* Hook. f. Hibiscus. Heavy. Palm Beach.  
 x *Lantana montevidensis* (Spreng.) Briq. Creeping lantana. Moderate. Brisbane (Long Pocket).  
 x *Musa* spp. Banana varieties (cultivars) Cavendish, Lady Finger and Williams Hybrid. Heavy. Narangba.  
 x *Pisum sativum* L. Garden pea. Heavy. Millaroo, Palmwoods.  
 x *Reinwardtia indica* Dum. Heavy. Brisbane.  
 x *Spergula arvensis* L. Corn spurry. Heavy. Glen Aplin.  
 x *Streptosolen jamesonii* (Benth.) Meirs. Browallia. Heavy. Brisbane (Toowong).  
 G *Trifolium baccarinii* Chiov. Heavy.  
 G *Trifolium burchellianum* Ser. ex DC. Cape clover. Heavy.  
 G *Trifolium glomeratum* L. Clustered clover. Heavy.  
 x *Trifolium repens* L. White clover. Heavy. Cooroy, East Barron, Kenilworth (Figure 6).



Fig. 6.—White clover infested with *Meloidogyne incognita*.

- G *Trifolium rueppellianum* Fresen. Heavy.  
 G *Trifolium semipilosum* Fresen. Heavy.  
 G *Trifolium subterraneum* L. Subterranean clover. Heavy.  
 x *Vigna sinensis* (L.) Endl. ex Hassk. Cowpea, variety Phoenix. Heavy.  
 Bli Bli.

**Meloidogyne javanica javanica** (Treub)

(Javanese root-knot nematode)

- x *Avena sativa* L. Oats. Light. Beerwah.  
 x *Centrosema pubescens* Benth. Centro. Light. Nambour.  
*Crassocephalum crepidioides* Benth. Thickhead. Moderate. Beerwah.  
 x *Cyamopsis tetragonoloba* (L.) Taub. Guar bean. Moderate. Nambour.  
 x *Desmodium uncinatum* DC. A tick trefoil. Moderate. Brookfield.  
 G *Dolichos lablab* L. Tonga or hyacinth bean. Heavy. (Figure 7.)  
 x *Echinochloa crus-galli* var. *frumentacea* (Roxb.) Wight. White panicum.  
 Moderate. Nambour.  
 x *Ficus macrophylla* Desf. Moreton Bay fig. Moderate. Bribie Island.  
 x *Glycine max* (L.) Merr. Soybean. Heavy. Nambour.  
 G *Melinis minutiflora* Beauv. Molasses grass. Light.  
 x *Pisum arvense* L. Field pea. Moderate. Beerwah.  
 x *Samanea saman* (Jacq.) Merr. Rain-tree. Heavy. Ayr.  
 x *Secale cereale* L. Rye. Light. Glasshouse Mountains.  
 G *Solanum pseudocapsicum* L. Madeira winter cherry. Heavy.  
 x *Sorghum bicolor* (L.) Moench. Sweet sorghum. Moderate. Beerwah,  
 Nambour.  
 x *Sorghum sudanense* (Piper) Stapf. Sweet Sudan grass. Light. Nambour.  
*Spergula arvensis* L. Corn spurry. Heavy. Glen Aplin.  
 x *Stylosanthes humilis* H.B.K. Townsville lucerne. Light. Nambour.  
 G *Trifolium glomeratum* L. Clustered clover. Heavy.  
 G *Trifolium hybridum* L. Alsike clover. Moderate.  
 G *Trifolium rueppellianum* Fresen. Heavy.  
 G *Trifolium semipilosum* Fresen. Heavy.  
 G *Trifolium subterraneum* L. Subterranean clover. Moderate  
 G *Trifolium tembense* Fresen. Light.  
 G *Trifolium usambarense* Taub. Light.  
 x *Triticum aestivum* L. Wheat. Light. Beerwah. (Figure 8.)  
 x *Vicia sativa* L. Common vetch. Moderate. Beerwah.  
 x *Zingiber officinale* Rosc. Ginger. Heavy. Palmwoods.

**PARAPHELENCHUS** (Micoletzky)

**Paraphelenchus pseudoparietinus** (Micoletzky)

- Cucumis sativus* L. Cucumber. Yeppoon.

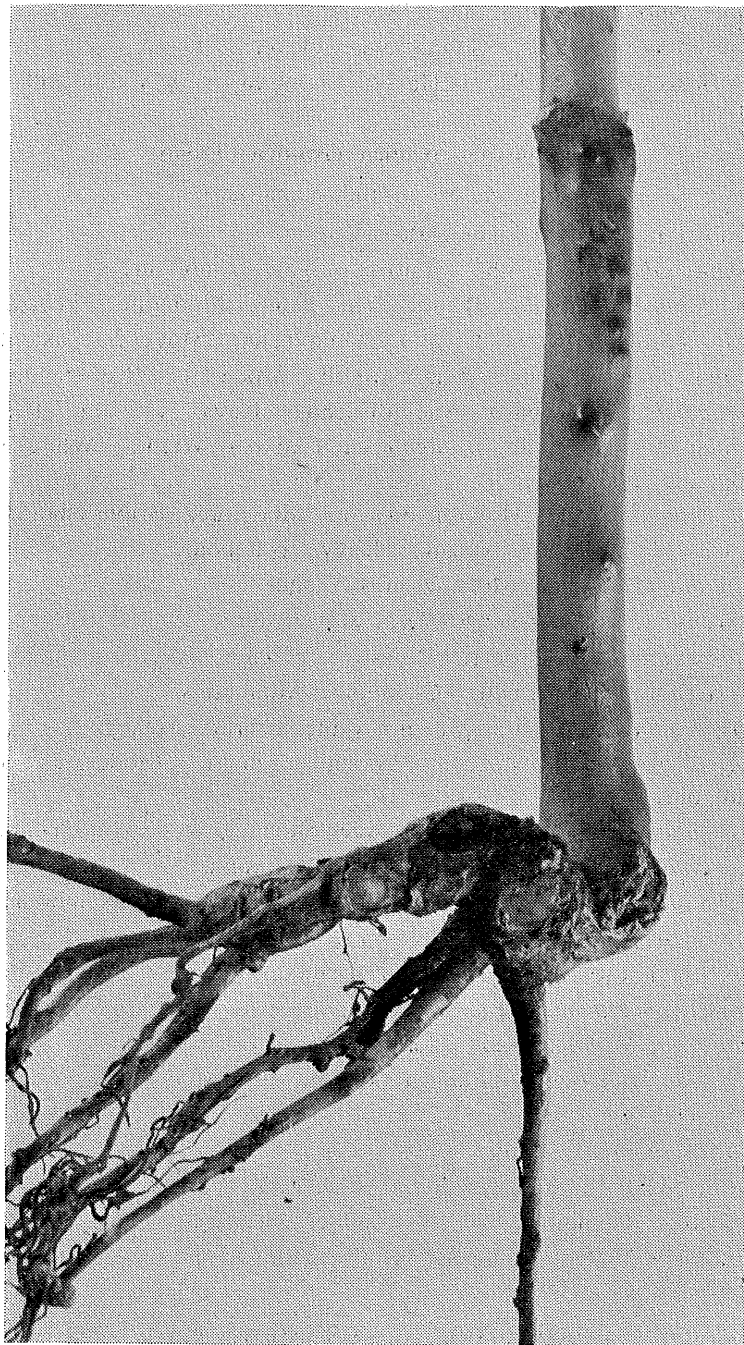


Fig. 7.—Galls on the aboveground portion of the stem of *Dolichos lablab* caused by *Meloidogyne javanica javanica*.



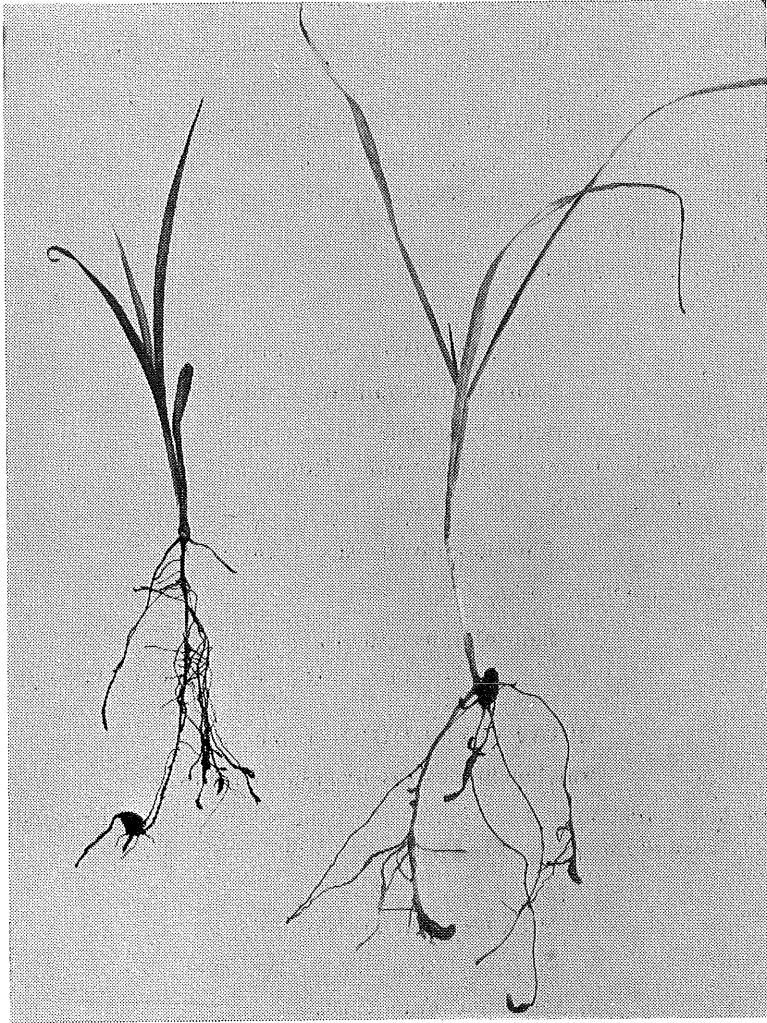


Fig. 8.—Seedlings of sweet sorghum (left) and wheat (right) infested with *Meloidogyne javanica javanica*.

**PARATYLENCHUS** Micoletzky

(Pin nematodes)

***Paratylenchus curvatus*** van der Linde

*Syn. Paratylenchus dianthus* Jenkins and Taylor

*Chrysanthemum morifolium* Ramat. *Chrysanthemum*. Brisbane (Botanic Gardens).

***Paratylenchus elachistus*** Steiner

*Syn. Paratylenchus minutus* Linford

*Vitis vinifera* L. Grape. Lyra, Severnlea.

**Paratylenchus microdorus** Andrassy

*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Brisbane (Long Pocket),  
Cunningham's Gap, Mt. Nebo.

**Paratylenchus projectus** Jenkins

*Nicotiana tabacum* L. Tobacco. Inglewood.

*Vicia sativa* L. Common vetch. Stanthorpe (C.O.D. Nursery).

*Vitis vinifera* L. Grape. Severnlea.

Soil. Brisbane (Sunnybank).

**PAURODONTUS** Thorne**Paurodontus apiticus** Thorne

*Ananas comosus* (L.) Merr. Pineapple. Beerwah.

*Medicago sativa* L. Lucerne. Richmond ("Rowena").

*Pisum sativum* L. Garden pea. Yeppoon.

**Paurodontus densus** Thorne

*Vitis vinifera* L. Grape. Inglewood.

**Paurodontus gracilis** Thorne

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Cooroy, Tewantin.

**PRATYLENCHOIDES** Winslow**Pratylenchoides crenicauda** Winslow

*Gerbera jamesonii* Bolus. Gerbera. Brisbane (Botanic Gardens, Nashville).

*P. crenicauda* was associated with a root-rot of gerberas.

**PRATYLENCHUS** Filipjev

(Root-lesion nematodes)

**Pratylenchus brachyurus** (Godfrey)

x *Ananas comosus* (L.) Merr. Pineapple. Beerwah, Brisbane (Brackenridge, Moggill), Cooroy, Didillibah, Elimbah, Innisfail, Kallangur, Kandanga, Mackay, Mutanee, Palmwoods, Woombye, Yeppoon, Yorkey's Knob. Root-rot of pineapples due to *P. brachyurus* is common in Queensland plantations.

x *Arachis hypogaea* L. Peanut. Gayndah, Gordonbrook, Memerambi, Tingoora, Wondai. (Figure 9). *P. brachyurus* is an important pathogen of peanuts in the South Burnett, causing lesions on the roots, hypocotyls, pegs and shells.

x *Araucaria cunninghamii* D. Don. Hoop pine. Benarkin, Gympie.

x *Citrullus vulgaris* Schrad. Watermelon. Coominya.

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Rochedale), Burrum, Murray Upper, Palmwoods.

- Cucurbita maxima* Duchesne. Pumpkin. Lawnton.
- x *Cyperus rotundus* L. Nut grass. Brisbane.
- G *Dolichos lablab* L. Tonga or hyacinth bean.
- Eucalyptus maculata* Hook. Spotted gum. Brisbane (Long Pocket).
- x *Fragaria X ananassa* Duchesne. Strawberry. Parada, Woombye, Woondum.
- x *Helianthus annuus* L. Sunflower. Wondai.
- Hornstedtia scottiana* (F. Muell.) K. Schum. A wild ginger. Junction of Palmerston Highway and Henderson Drive (North Queensland).
- Lupinus angustifolius* L. New Zealand blue lupin. Tolga.
- x *Lycopersicon esculentum* Mill. Tomato. Charters Towers.
- Medicago denticulata* Willd. Burr medic. Slacks Creek.
- x *Medicago sativa* L. Lucerne. Slacks Creek.
- Musa* sp. Banana variety (cultivar) Williams Hybrid. Narangba.
- x *Nicotiana tabacum* L. Tobacco. Dimbulah, Glasshouse Mountains.
- G *Paspalum scrobiculatum* L. Scrobic. *P. brachyurus* has caused severe stunting of *P. scrobiculatum* under glasshouse conditions.
- x *Persea americana* Mill. Avocado. Ormiston.
- x *Phaseolus mungo* L. Mung bean. Ormiston.
- Prunus persica* (L.) Batsch. Peach. Imbil.
- Saccharum officinarum* L. Sugar cane. Bundaberg.
- x *Solanum tuberosum* L. Potato. East Barron. (Figure 10). *P. brachyurus* produces a disease known as potato 'pimple'. Fourteen acres at East Barron were affected in the 1962 season when potatoes followed a paspalum/Rhodes grass pasture.
- G *Stizolobium* spp. Velvet beans.
- Trifolium pratense* L. Red clover. Southbrook.
- x *Trifolium repens* L. White clover. Conondale, Cooroy, Kybong, Maleny, Wolvi.
- x *Vigna sinensis* (L.) Endl. ex Hassk. Cowpea. Charters Towers, Nambour, Ormiston.
- x *Zea mays* L. Maize. Kingaroy, Wondai.
- Soil. Corumba, Ravenshoe (in a pasture of Rhodes grass, green panic and glycine).

### ***Pratylenchus coffeae* (Zimmerman)**

*Syn. Pratylenchus musicola* (Cobb)

*P. coffeae* has been found in lesions on the roots of the following plants in the Stanthorpe-Wallangarra-Dalveen area:

- x *Brassica oleracea* L. var. *boytrytis* L. Cauliflower.
- x *Brassica oleracea* L. var. *capitata* L. Cabbage.
- x *Brassica oleracea* L. var. *italica* Plenck. Broccoli.
- x *Bromus unioloides* H.B.K. Prairie grass.
- x *Coronopus didymus* (L.) Sm. Bittercress.
- x *Cydonia oblonga* Mill. Quince.
- x *Cynodon dactylon* (L.) Pers. Couch.
- x *Digitaria adscendens* (H.B.K.) Henrard. Summer grass.



Fig. 9.—Peanut plant with lesions on the pods, pegs and hypocotyl caused by *Pratylenchus brachyurus*.

- x *Hypochoeris radicata* L. Flatweed.
- x *Juglans regia* L. English walnut.
- G *Linum usitatissimum* L. Linseed.
- x *Lolium rigidum* Gaud. Wimmera ryegrass.
- x *Lupinus angustifolius* L. New Zealand blue lupin.
- x *Lycopersicon esculentum* Mill. Tomato.
- x *Malus sylvestris* (L.) Mill. Apple.
- x *Olea europaea* L. Olive.

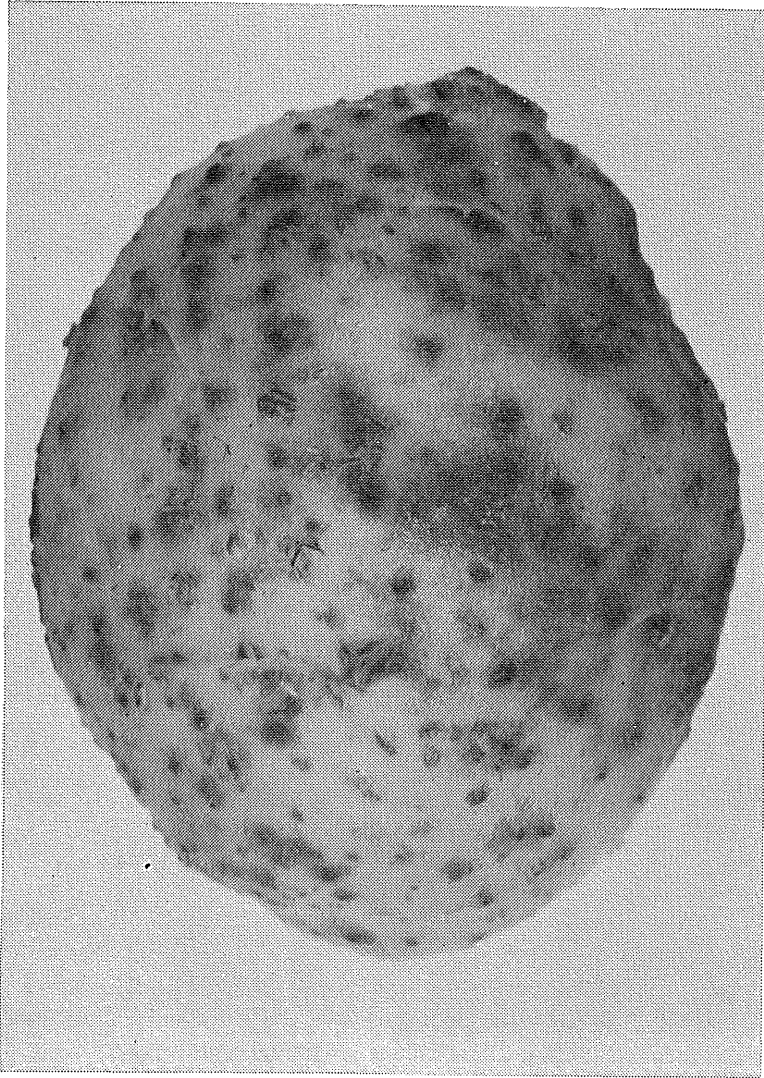


Fig. 10.—Potato tuber infested with *Pratylenchus brachyurus*.

- x *Phaseolus vulgaris* L. French bean.
- x *Pisum sativum* L. Garden pea.
- x *Prunus armeniaca* L. Apricot.
- x *Prunus persica* (L.) Batsch. Peach.
- x *Prunus salicina* Lindl. Japanese plum.
- x *Pyrus communis* L. Pear.
- x *Rumex acetosella* L. Sorrel.
- x *Solanum tuberosum* L. Potato.
- x *Sonchus oleraceus* L. Common sowthistle.
- x *Spergula arvensis* L. Corn spurry.
- x *Trifolium pratense* L. Red clover.

- x *Verbena bonariensis* L. Purple-top.
- x *Vigna sinensis* (L.) Endl. ex Hassk. Cowpea.
- x *Vitis vinifera* L. Grape.

*P. coffeae* has also been found in lesions on the roots of the banana variety Williams Hybrid at Japoonvale and Mooloolah.

#### **Pratylenchus neglectus** (Rensch)

- Syn. Pratylenchus minyus* Sher and Allen  
*Prunus armeniaca* L. Apricot. Warwick.

#### **Pratylenchus vulnus** Allen and Jensen

- x *Chrysanthemum morifolium* Ramat. Chrysanthemum. Brisbane (Botanic Gardens).
- x *Fragaria X ananassa* Duchesne. Strawberry. Frenchville, Home Hill, Mt. Cotton, Ormiston. *P. vulnus* is associated with a root-rot of strawberries in Queensland.

#### **Pratylenchus zae** Graham

- Ananas comosus* (L.) Merr. Pineapple. Beerwah, Kallangur, Nambour.  
*Asclepias fruticosa* L. Narrow-leaf cotton bush. Beerwah.  
*Citrus limon* (L.) (Burm.) f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Clump Point, Kennedy, Mundubbera.  
*Digitaria didactyla* Willd. Queensland blue couch. Booval, Brisbane (Darra).  
*Fragaria X ananassa* Duchesne. Strawberry. Nambour.  
*Lactuca sativa* L. Lettuce. Ipswich, Maleny.  
*Lolium perenne* L. Perennial ryegrass. Slacks Creek.  
*Lupinus angustifolius* L. New Zealand blue lupin. Tolga.  
*Mangifera indica* L. Mango. Ayr.  
x *Medicago sativa* L. Lucerne. Samford.  
x *Nicotiana tabacum* L. Tobacco. Dimbulah.  
*Panicum maximum* Jacq. Guinea grass. Brisbane.  
x *Phaseolus vulgaris* L. French bean. Cooroy.  
x *Prunus persica* (L.) Batsch. Peach. Brisbane (Pinkenba).  
x *Saccharum officinarum* L. Sugar cane. Bundaberg, Imbil, Mossman.  
*Sechium edule* Sw. Choko. Montville.  
x *Sorghum bicolor* (L.) Moench. Sweet sorghum. Brisbane (Moggill), Nambour.  
 Extensive root-rot of sorghum due to *P. zae* was noted at Moggill in 1956 (Figure 11).  
*Trifolium subterraneum* L. Subterranean clover. Lawes.  
*Vitis vinifera* L. Grape. Coominya.  
 Pasture of green panic, Rhodes grass and glycine, Ravenshoe.  
 Soil. Coominya, Elimbah, Glasshouse Mountains, Highvale, Maleny, Tewantin, Maclean (New South Wales).

#### **PSEUDHALENCHUS** Tarjan

##### **Pseudhalenchus anchilisposomus** Tarjan

- Ananas comosus* (L.) Merr. Pineapple. Bauple, Beerwah, Bowen, Brisbane (Moggill), Didillibah, Elimbah, Glasshouse Mountains, Innisfail, Nambour, Tewantin, Woombye.

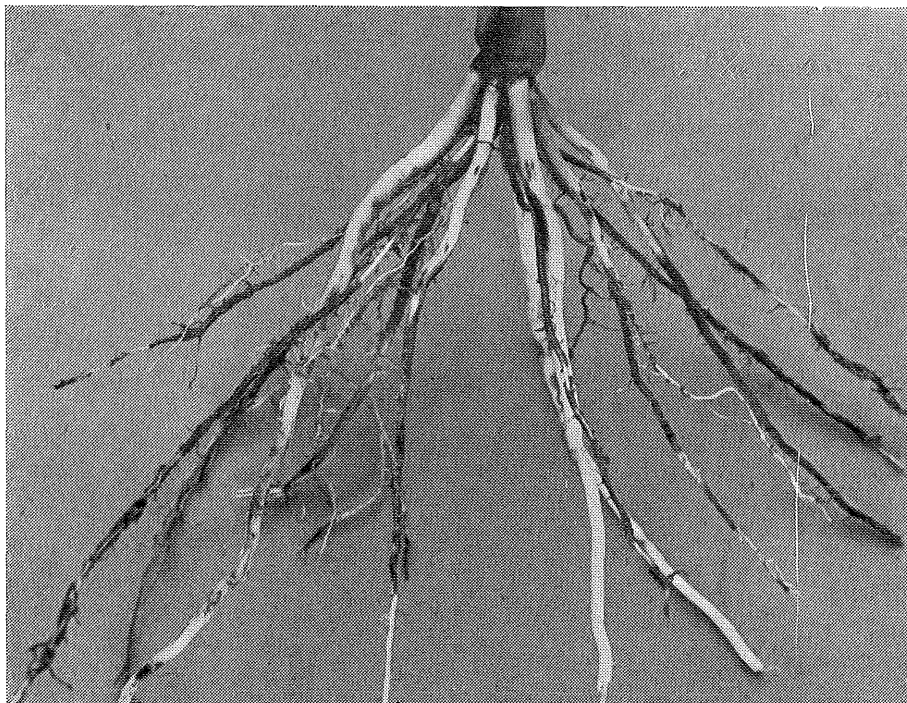


Fig. 11.—Lesions on sorghum roots infested with *Pratylenchus zaei*.

- Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange).  
 Bundaberg, Burrum, Kennedy.  
*Cupaniopsis anacardioides* (A. Rich.) Radlk. Cupania tree. Mulambin Beach.  
*Gerbera jamesonii* Bolus. Gerbera. Brisbane (Nashville).  
*Lycopersicon esculentum* Mill. Tomato. Yeppoon.  
*Pandanus* sp. Pandanus or screw pine. Mulambin Beach.  
*Prunus persica* (L.) Batsch. Peach. Bacchus.  
*Trifolium repens* L. White clover. Cooroy, Currumbin.  
*Vitis vinifera* L. Grape. Glen Aplin, Inglewood.

#### ***Pseudhalenchus minutus* Tarjan**

- Ananas comosus* (L.) Merr. Pineapple. Beerwah, Brisbane (Moggill),  
 Glasshouse Mountains, Nambour, Woombye.  
*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet  
 orange). Brisbane (Mt. Gravatt).  
*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Sunnybank).  
*Fragaria X ananassa* Duchesne. Strawberry. Brisbane (Salisbury).  
*Opuntia* sp. A prickly pear. Mulambin Beach.  
*Pinus elliotti* Engelm. Slash pine. Kilkivan (Jimmy's Scrub logging area).  
*Vitis vinifera* L. Grape. Severnlea.  
 Soil. Near Utchee Creek (North Queensland).

**PSILENCHUS** de Man**Psilenchus duplexus** (Hagemeyer and Allen)

*Ananas comosus* (L.) Merr. Pineapple. Didillibah.

*Trifolium repens* L. White clover. Pomona.

**Psilenchus gracilis** Thorne

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Rockhampton.

**Psilenchus hilarulus** de Man

*Themeda australis* (R.Br.) Stapf. Kangaroo grass. Mt. Nebo.

*Trifolium repens* L. White clover. Crawley Vale.

**Psilenchus magnidens** Thorne

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Elimbah, Glasshouse Mountains, Pomona, Tewantin.

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Rochedale).

*Malus sylvestris* (L.) Mill. Apple. Lyra.

*Saccharum officinarum* L. Sugar cane. Harwood (New South Wales).

*Trifolium repens* L. White clover. Cooroy, Maleny.

*Zea mays* L. Maize. Coolum.

Soil. Lyra.

**Psilenchus tumidus** Colbran

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Elimbah, Palmwoods, Pomona.

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt).

*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Rocklea).

**RADOPHOLUS** Thorne

(Burrowing nematodes)

**Radopholus inequalis** Sauer

*Casuarina littoralis* Salisb. Black sheoak. Eudlo (Jawarra Park), Burrum.

*Citrus sinensis* Osbeck. Sweet orange. Mundubbera.

*Eucalyptus micrantha* DC. Scribbly gum. Eudlo.

**Radopholus neosimilis** Sauer

*Casuarina littoralis* Salisb. Black sheoak. Burrum.

**Radopholus similis** (Cobb)

(Burrowing nematode)

x *Annona squamosa* L. Custard apple var. Island Gem. Redland Bay.

x *Desmodium uncinatum* DC. A tick trefoil. Nambour.

x *Musa* spp. Banana varieties (cultivars) Cavendish, Lady Finger and Williams Hybrid. Brisbane (Brookfield, Moggill), Bundaberg, Byfield, Caboolture, Cairns, Currumbin, Eudlo, Gilston, Kallangur, Mt. Mee, Nambour, Pialba, Redland Bay, Samford, Victoria Point, Wamuran, Woongoolba. Root-rot of bananas due to *R. similis* is very common in Queensland and northern New South Wales.



- x *Musa banksii* F. Muell. A wild banana. Rain-forest on a slope below a banana plantation infested with *R. similis* at Tully.
- G *Phaseolus mungo* L. Mung bean.
- x *Sorghum sudanense* (Piper) Stapf. Sweet Sudan grass. Nambour.
- x *Stizolobium* spp. Velvet beans. Nambour.
- x *Stylosanthes humilis* H.B.K. Townsville lucerne. Nambour.
- x *Zea mays* L. Maize. Nambour.

**ROTYLENCHULUS** Linford and Oliveira  
(Reniform nematodes)

***Rotylenchulus parvus*** (Williams)

- x *Zea mays* L. Maize. Wooroolin. Females of *R. parvus* were plentiful on maize roots on a farm at Wooroolin in the 1962-63 season (Figure 12).

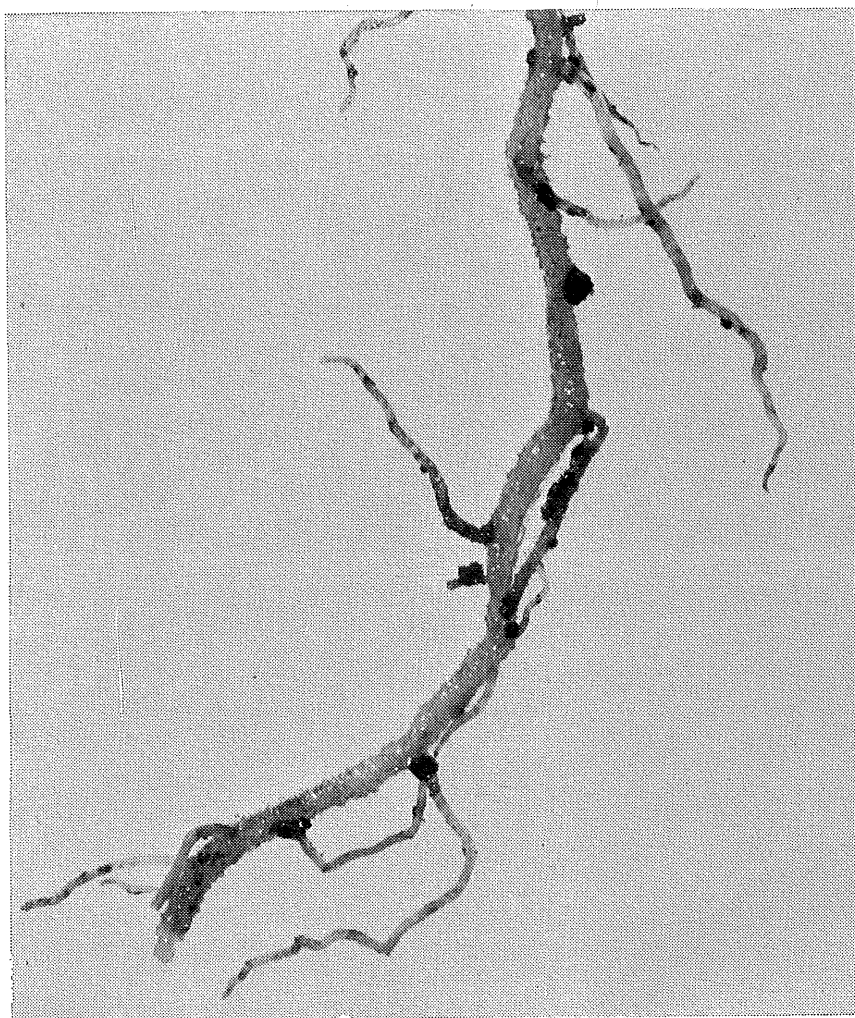


Fig. 12.—Maize root infested with *Rotylenchulus parvus*.

**Rotylenchulus reniformis** Linford and Oliveira

(Reniform nematode)

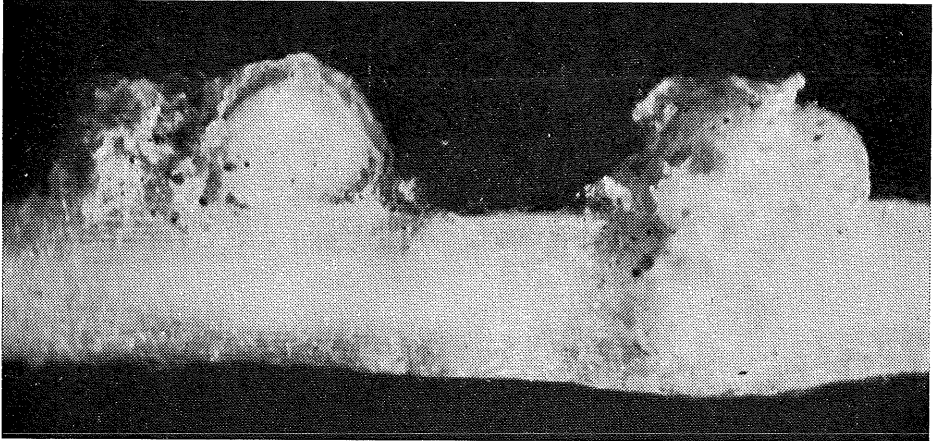
x *Calopogonium mucunoides* Desv. Calopo. South Johnstone.x *Carica papaya* L. Papaw. Yeppoon.*Chrysanthemum morifolium* Ramat. Chrysanthemum. Brisbane (Botanic Gardens).*Lycopersicon esculentum* Mill. Tomato. Bowen, Rita Is., Yeppoon (Figure 13).

Fig. 13.—Egg masses of *Rotylenchulus reniformis* on a tomato root.

Heavy infestations of *R. reniformis* have been found in tomato plantings at Bowen.

*Mangifera indica* L. Mango. Ayr.

**ROTYLENCHUS** Filipjev

(Spiral nematodes)

**Rotylenchus brevicaudatus** Colbran*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Innisfail.*Carica papaya* L. Papaw. Brisbane (Sunnybank).*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt, Pullenvale, Rochedale), Emerald Creek (North Queensland), Gayndah, Lawnton.*Cucurbita pepo* L. var. *medullosa* Alef. Marrow. Rockhampton.x *Cyperus rotundus* L. Nut grass. Lawes.*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Wynnum).*Fragaria X ananassa* Duchesne. Strawberry. Ormiston.*Lycopersicon esculentum* Mill. Tomato. Yeppoon.*Medicago sativa* L. Lucerne. Brisbane (Moggill), Jimboomba (Maclean's Bridge).

*Panicum maximum* Jacq. Guinea grass. Brisbane.  
*Saccharum officinarum* L. Sugar cane. Imbil.  
*Trifolium subterraneum* L. Subterranean clover. Lawes.  
*Vitis vinifera* L. Grape. Inglewood, Roma. Severnlea.  
 Soil. Dalby, Ipswich, Stanthorpe, hills overlooking Harwood (New South Wales).

### SCUTELLONEMA Andrassy

(Spiral nematodes)

#### *Scutellonema brachyurum* (Steiner)

*Ananas comosus* (L.) Merr. Pineapple. Montville, North Arm.  
*Beta vulgaris* L. var. *vulgaris*. Beetroot. Victoria Point.  
*Carica papaya* L. Papaw. Ormiston.  
 x *Cyamopsis tetragonoloba* (L.) Taub. Guar bean. Nambour.  
*Dianthus caryophyllus* L. Carnation. Wallangarra.  
*Fragaria X ananassa* Duchesne. Strawberry. Brisbane (Salisbury), Mt. Cotton.  
*Lactuca sativa* L. Lettuce. Ipswich.  
*Lycopersicon esculentum* Mill. Tomato. Ipswich.  
*Musa* spp. Banana varieties (cultivars) Cavendish, Williams Hybrid. Nambour, Redland Bay.  
*Passiflora edulis* Sims forma *edulis*. Passionfruit. Yeppoon.  
*Prunus armeniaca* L. Apricot. Warwick.  
*Prunus persica* (L.) Batsch. Peach. Bacchus, Wyberba.  
*Trifolium repens* L. White clover. Maleny.  
*Vitis vinifera* L. Grape. Severnlea.  
 Soil. Brisbane (Eight Mile Plains), Rockhampton.

#### *Scutellonema minutum* Sher

Soil. Fraser Is., Miriam Vale.

#### *Scutellonema truncatum* Sher

Soil. Miriam Vale.

### SEINURA Fuchs

#### *Seinura oswegoensis* (van der Linde)

Soil. Brisbane (Eight Miles Plains).

#### *Seinura christiei* J. B. Goodey

*Syn. Aphelenchoides tenuicaudatus* Christie

Soil. Applethorpe, Brisbane (Acacia Ridge), Elimbah, Gilston, Glasshouse Mountains, Maryborough, Mt. Mee, Wamuran.

*S. christiei* is a predatory species which has been observed in the process of feeding on *Pratylenchus coffeae*. It is also common in banana plantations infested with *Radopholus similis*.

**STICTYLUS** Thorne**Stictylus asymmetricus** Thorne

*Kochia tomentosa* (Moq.) F. Muell. Inglewood.

**TELOTYLENCHUS** Siddiqi**Telotylenchus hastulatus** (Colbran) Fisher\*

*Syn. Belonolaimus hastulatus* Colbran

*Citrus sinensis* Osbeck. Sweet orange. Mundubbera.

*Cupaniopsis anacardioides* (A. Rich) Radlk. Cupania tree. Mulambin Beach.

**Telotylenchus whitei** Fisher\*

*Eucalyptus resinifera* Sm. Red stringybark. Burrum.

*Kochia tomentosa* (Moq.) F. Muell. Inglewood.

*Pinus elliotii* Engelm. Slash pine. Beerwah (Coochin logging area).

**TRICHODORUS** Cobb

(Stubby-root nematodes)

**Trichodorus minor** Colbran

*Ananas comosus* (L.) Merr. Pineapple. Beerwah, Caboolture, Cooroy, Glasshouse Mountains, Kallangur.

*Camellia sinensis* (L.) O. Kuntze. Tea. Innisfail.

*Chloris gayana* Kunth. Rhodes grass. Upper Barron.

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Beerwah, Brisbane, Burrum, Gayndah, Lawnton, Mundubbera.

*Digitaria didactyla* (Willd.). Queensland blue couch. Booval, Brisbane (Rocklea, Sunnybank, Wynnum), Woombye.

*Fragaria X ananassa* Duchesne. Strawberry. Nambour.

*Lycopersicon esculentum* Mill. Tomato. Brisbane (Moggill), Redcliffe. (Figure 14).

*Malus sylvestris* (L.) Mill. Apple. Applethorpe.

*Medicago sativa* L. Lucerne. Brisbane (Moggill).

*Musa banksii* F. Muell. A wild banana. Tully.

*Musa* sp. Banana variety (cultivar) Williams Hybrid. Brisbane (Rochedale), Nambour.

*Nicotiana tabacum* L. Tobacco. Biboohra.

*Ornithopus sativus* Brot. Serradella. Slacks Creek.

*Pinus elliotii* Engelm. Slash pine. Beerwah.

*Pisum sativum* L. Garden pea. Millaroo.

*Saccharum officinarum* L. Sugar cane. Bli Bli.

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\* In press.



Fig. 14.—Tomato seedlings. Left, normal; right, damaged by *Trichodorus minor*.

*Secale cereale* L. Rye. Calavos.  
*Sesbania aculeata* Pers. Sesbania pea. Coolum.  
*Trifolium repens* L. White clover. Maleny.  
*Vitis vinifera* L. Grape. Ballandean, Coominya, Severnlea, Warwick.  
 Pasture containing green panic, Rhodes grass and glycine, Ravenshoe.  
 Soil. Hills overlooking Harwood and Maclean (New South Wales).

**Trichodorus porosus** Allen

*Carica papaya* L. Papaw. Sunnybank.  
*Cupressus sempervirens* L. var. *stricta* Ait. Pencil pine. Brisbane (Park Ridge).  
*Persea americana* Mill. Avocado. Beerwah, Glasshouse Mountains, Mapleton,  
 Montville, Palmwoods, Woombye.  
*Saccharum officinarum* L. Sugar cane. Ayr, Childers, Home Hill, Isis, Mackay.  
*Vitis vinifera* L. Grape. Glen Aplin.

**TYLENCHORHYNCHUS** Cobb

(Stunt nematodes)

**Tylenchorhynchus brevidens** Allen

Soil. Texas.

**Tylenchorhynchus capitatus** Allen

*Cucurbita maxima* Duchesne. Pumpkin. Toowoomba.  
*Dianthus caryophyllus* L. Carnation. Wallangarra.  
*Fragaria X ananassa* Duchesne. Strawberry. Nambour.  
*Lycopersicon esculentum* Mill. Tomato. Ballandean.  
*Plantago major* L. Larger plantain. Stanthorpe.  
*Solanum tuberosum* L. Potato. Toowoomba.

**Tylenchorhynchus ewingi** Hopper

Soil. Brisbane (Botanic Gardens).

**Tylenchorhynchus martini** Fielding

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Murray Upper (North Queensland).  
*Saccharum officinarum* L. Sugar cane. Ayr, Bundaberg, Home Hill, Ingham,  
 Mackay, Mossman, Harwood (New South Wales).

**Tylenchorhynchus striatus** Allen

*Trifolium repens* L. White clover. Currumbin.

**TYLENCHULUS** Cobb

**Tylenchulus obscurus** Colbran

*Hodgkinsonia frutescens* C. T. White. Tolga. (Figure 15).  
 Soil. East Palmerston, Tully.

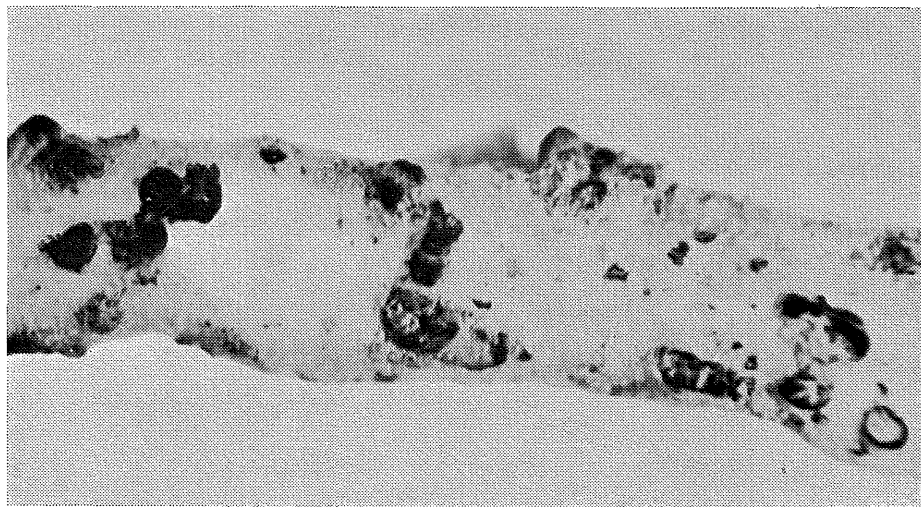


Fig. 15.—A root of *Hodgkinsonia frutescens* covered with the scales of *Tylenchulus obscurus*.

### **Tylenchulus semipenetrans** Cobb

(Citrus nematode)

- x *Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Ayr, Beerwah, Brisbane, Burrum, Charters Towers, Clump Point, Condamine, Elimbah, Gayndah, Grantham, Howard, Jimboomba, Koah, Lawes, Mundubbera, Rockhampton, Yeppoon. (Figure 16).
- x *Olea europaea* L. Olive. Glen Aplin, Lawes.
- x *Vitis vinifera* L. Grape. Charters Towers, Glen Aplin, Warwick, Yelarbon.

### **TYLENCHUS** Bastian

#### **Tylenchus baloghi** Andrassy

*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Kalinga).

*Nicotiana tabacum* L. Tobacco. Ayr.

Soil. Montville.

#### **Tylenchus bryophilus** Steiner

Moss. Cunningham's Gap.

#### **Tylenchus costatus** de Man

*Ananas comosus* (L.) Merr. Pineapple. Dayboro.

*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Koah.

*Ficus carica* (L.) Cultivated fig. Biloela.

x *Lupinus angustifolius* L. New Zealand blue lupin. Applethorpe.

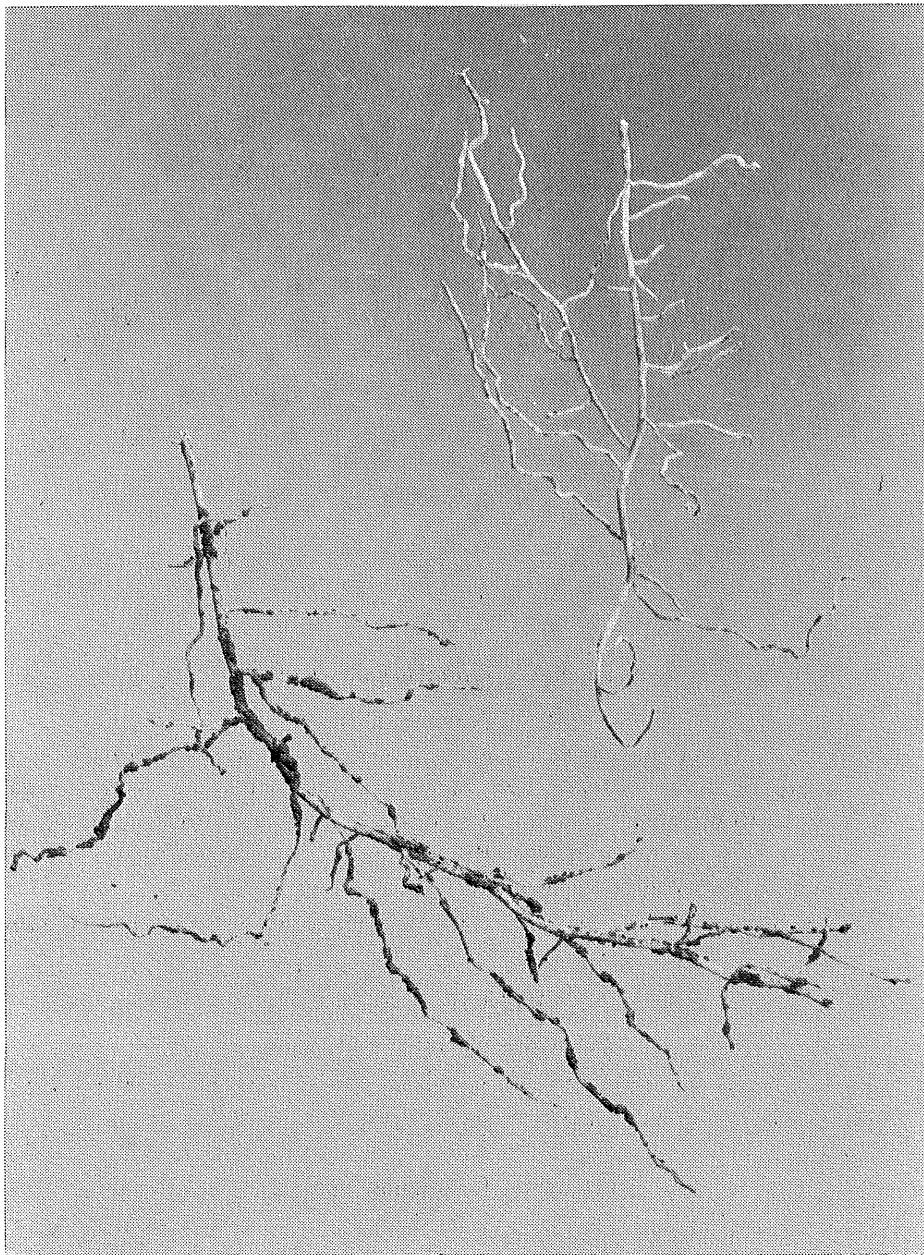


Fig. 16.—Citrus roots. Upper, healthy; lower, infested with *Tylenchulus semipenetrans*.

*Malus sylvestris* (L.) Mill. Apple. Lyra.

*Prunus persica* (L.) Batsch. Peach. Lyra.

*Vitis vinifera* L. Grape. Ballandean, Glen Aplin, Young (New South Wales).  
Soil. Tully.



**Tylenchus discrepans** Andrassy

- Acronychia acidula* F. Muell. Tolga.  
*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Keperra).  
*Musa* sp. Banana variety (cultivar) Williams Hybrid. Brisbane (The Gap).  
*Portulaca oleracea* L. Pigweed. Applethorpe.  
*Trifolium repens* L. White clover. Cooroy, Maleny.  
 Soil. Tully.

**Tylenchus emarginatus** Cobb

- Syn. (new). *T. hexalineatus* Gaerart  
*T. (Cephalenchus) megacephalus* J. B. Goodey  
*Ficus opposita* Miq. A sandpaper fig. Mulambin Beach.  
*Medicago sativa* L. Lucerne. Brisbane (Moggill).  
*Opuntia* sp. A prickly pear. Mulambin Beach.  
*Pinus elliottii* Engelm. Slash pine. Beerwah.  
*Themeda australis* (R. Br.) Stapf. Kangaroo grass. Mt. Nebo.  
*Vitis vinifera* L. Grape. Lyra.  
 Soil. Hills overlooking Harwood (New South Wales).

**Tylenchus exiguus** de Man

- Acronychia acidula* F. Muell. Tolga.  
*Ananas comosus* (L.) Merr. Pineapple. Bowen, Coolum, Elimbah, Glasshouse Mountains, Nambour.  
*Beta vulgaris* L. var. *vulgaris*. Beetroot. Yeppoon.  
*Bromus unioloides* H.B.K. Prairie grass. Thulimbah.  
*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange). Brisbane (Mt. Gravatt, Pullenvale, Rochedale), Bundaberg, Burrum, Gatton, Gayndah, Lawnton, Tinana.  
*Dianthus caryophyllus* L. Carnation. Wallangarra.  
*Digitaria didactyla* Willd. Queensland blue couch. Brisbane (Sunnybank).  
*Ficus carica* L. Cultivated fig. Biloela.  
*Hodgkinsonia frutescens* C. T. White. Tolga.  
*Lactuca sativa* L. Lettuce. Mt. Ninderry.  
*Lycopersicon esculentum* Mill. Tomato. Yeppoon.  
*Musa banksii* F. Muell. A wild banana. Tully.  
*Musa* sp. Banana variety (cultivar) Williams Hybrid. Bundaberg, Mt. Ninderry, Woombye.  
*Paspalum dilatatum* Poir. Paspalum. Miriam Vale.  
*Phaseolus vulgaris* L. French bean. Brisbane (Manly), Gracemere, Ipswich, Rockhampton.  
*Pisum sativum* L. Garden pea. Yeppoon.  
*Trifolium repens* L. White clover. Cooroy.  
*Triticum aestivum* L. Wheat. Thulimbah.  
*Vitis vinifera* L. Grape. Inglewood, Roma, Severnlea, Stanthorpe.  
*Zea mays* L. Maize. Beerwah.  
 Soil. Cunningham's Gap, Highvale, Miriam Vale.

**Tylenchus filiformis** Butschlii

*Ananas comosus* (L.) Merr. Pineapple. Didillibah.  
*Araucaria cunninghamii* D. Don. Hoop pine. Dunballa.  
 Soil. Cunningham's Gap, Tully.

**Tylenchus leptosoma** de Man

*Mangifera indica* L. Mango. Buderim.  
*Musa* sp. Banana variety (cultivar) Williams Hybrid. Bundaberg.  
*Trifolium repens* L. White clover. Wolvi.  
 Soil. Beerwah, Burrum, Cooroy, Glasshouse Mountains, Maleny, Harwood  
 (New South Wales).

**Tylenchus polyhypnus** Steiner and Albin

*Ananas comosus* (L.) Merr. Pineapple. Innisfail, Kandanga, Rosemount.  
*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet  
 orange). Bouldercombe.  
*Fragaria X ananassa* Duchesne. Strawberry. Brisbane (Salisbury).  
*Lycopersicon esculentum* Mill. Tomato. Bowen, Yeppoon.  
*Passiflora edulis* Sims forma *edulis*. Passionfruit. Yeppoon.  
*Portulaca oleracea* L. Pigweed. Applethorpe.  
*Vitis vinifera* L. Grape. Roma.

**Tylenchus thornei** Andrassy

*Trifolium repens* L. White clover. Wolvi.

**XIPHINEMA** Cobb**Xiphinema americanum** Cobb

*Annona squamosa* L. Custard apple. Redland Bay.  
*Citrus limon* (L.) Burm. f. Rough lemon. Burrum.  
*Macadamia tetraphylla* L.A.S. Johnson. A Macadamia or Queensland nut.  
 Brisbane (Sunnybank).  
*Persea americana* Mill. Avocado. Brisbane (Sunnybank), Mapleton, Monville,  
 Mt. Tamborine, Palmwoods.  
*Prunus persica* (L.) Batsch. Peach. Severnlea.  
*Vitis vinifera* L. Grape. Severnlea.  
 Soil. Miriam Vale, Harwood (New South Wales).

**Xiphinema diversicaudatum** Micoletzky

*Casuarina equisetifolia* L. Dune sheoak. Mulambin Beach.  
*Citrus limon* (L.) Burm. f. Rough lemon. Burrum.  
*Opuntia* sp. A prickly pear. Mulambin Beach.

**Xiphinema elongatum** Schuurmans Stekhoven and TeunissenSyn. *X. campinense* Lordello*X. pratense* Loos*Chloris gayana* Kunth. Rhodes grass. Brisbane (Archerfield, Moggill), Elimbah.*Citrus limon* (L.) Burm. f. (rough lemon) or *C. sinensis* Osbeck (sweet orange).

Brisbane (Long Pocket).

*Digitaria didactyla* Willd. Blue couch grass. Brisbane (Banyo).*Fragaria X ananassa* Duchesne. Strawberry. Victoria Point.*Medicago sativa* L. Lucerne. Brisbane (Moggill).*Persea americana* Mill. Avocado. Ormiston.*Saccharum officinarum* L. Sugar cane. Bundaberg.

Soil. Elimbah, Ormiston.

**Xiphinema radicola** Goodey*Melastoma polyanthum* Plume. Blue tongue. Coolum.*Paspalum dilatatum* Poir. Paspalum. Brisbane (Archerfield), Byfield, Maleny.*Trifolium repens* L. White clover. Maleny.

Soil. Burrum.

**SECTION II****Host/Nematode List***Acronychia acidula* F. Muell.*Tylenchus discrepans**Tylenchus exiguus**Agrostis tenuis* Sibth. Browntop bent grass.*Anguina agrostis**Ananas comosus* (L.) Merr. Pineapple.*Criconema pectinatum**Pseudhalenchus anchilisposomus**Criconemoides ornatum**Pseudhalenchus minutus**Helicotylenchus dihystra**Psilenchus duplexus**Helicotylenchus multicinctus**Psilenchus magnidens**Hemicriconemoides mangiferae**Psilenchus tumidus**Hemicriconemoides obtusus**Rotylenchus brevicaudatus**Hemicycliophora ovata**Scutellonema brachyurum**Hemicycliophora truncata**Trichodorus minor**Paurodontus apiticus**Tylenchus costatus**Paurodontus gracilis**Tylenchus exiguus**Pratylenchus brachyurus**Tylenchus filiformis**Pratylenchus zae**Tylenchus polyhyppnus**Angophora costata* (Gaertn.) Domin. Rusty gum.*Fergusobia tumefaciens**Angophora subvelutina* F. Muell. Broad-leaved apple.*Fergusobia tumefaciens**Annona squamosa* L. Custard apple.*Helicotylenchus dihystra**Xiphinema americanum**Radopholus similis*

- Arachis hypogaea* L. Peanut.  
*Meloidogyne hapla* *Pratylenchus brachyurus*
- Araucaria cunninghamii* D. Don. Hoop pine.  
*Helicotylenchus dihystra* *Tylenchus filiformis*  
*Pratylenchus brachyurus*
- Asclepias fruticosa* L. Narrow-leaf cotton bush.  
*Helicotylenchus dihystra* *Pratylenchus zeae*
- Astrebala pectinata* (Lindl.) F. Muell. ex Benth. Barley Mitchell grass.  
*Anguina microlaenae*
- Avena sativa* L. Oats.  
*Helicotylenchus dihystra* *Meloidogyne javanica javanica*
- Bauhinia* sp.  
*Helicotylenchus dihystra*
- Beta vulgaris* L. var. *cicla* L. Silver beet.  
*Helicotylenchus dihystra*
- Beta vulgaris* L. var. *vulgaris*. Beetroot.  
*Helicotylenchus dihystra* *Scutellonema brachyurum*  
*Heterodera schachtii* *Tylenchus exiguus*
- Brassica napobrassica* (L.) Mill. Swede turnip.  
*Heterodera schachtii*
- Brassica oleracea* L. var. *botrytis* L. Cauliflower.  
*Pratylenchus coffeae*
- Brassica oleracea* L. var. *capitata* L. Cabbage.  
*Helicotylenchus dihystra* *Meloidogyne arenaria thamesi*  
*Heterodera schachtii* *Pratylenchus coffeae*
- Brassica oleracea* L. var. *italica* Plenck. Broccoli.  
*Pratylenchus coffeae*
- Bromus unioloides* H.B.K. Prairie grass.  
*Pratylenchus coffeae* *Tylenchus exiguus*
- Cajanus cajan* (L.) Millsp. Pigeon pea.  
*Helicotylenchus dihystra*
- Calopogonium mucunoides* Desv. Calopo.  
*Meloidogyne arenaria thamesi* *Rotylenchulus reniformis*
- Camellia sinensis* (L.) O. Kuntze. Tea.  
*Trichodorus minor*
- Capsicum frutescens* L. Capsicum, variety California Wonder.  
*Hemicyclophora nudata*
- Carica papaya* L. Papaw.  
*Criconemoides mutabile* *Rotylenchulus brevicaudatus*  
*Helicotylenchus dihystra* *Scutellonema brachyurum*  
*Rotylenchulus reniformis* *Trichodorus porosus*

- Casuarina equisetifolia* L. Dune sheoak.  
*Hemicriconemoides brachyurus* *Hemicycliophora labiata*  
*Hemicriconemoides cocophillus* *Xiphinema diversicaudatum*  
*Hemicriconemoides obtusus*
- Casuarina littoralis* Salisb. Black sheoak.  
*Hemicycliophora truncata* *Radopholus neosimilis*  
*Radopholus inequalis*
- Centella asiatica* (L.) Urb. Pennyweed.  
*Meloidogyne incognita*
- Centrosema pubescens* Benth. Centro.  
*Helicotylenchus dihystra* *Meloidogyne javanica javanica*
- Chenopodium album* L. Fat hen.  
*Meloidogyne incognita*
- Chloris gayana* Kunth. Rhodes grass.  
*Trichodorus minor* *Xiphinema elongatum*
- Chrysanthemum morifolium* Ramat. Chrysanthemum.  
*Aphelenchoides ritzema-bosi* *Pratylenchus vulnus*  
*Basiria graminophila* *Rotylenchulus reniformis*  
*Paratylenchus curvatus*
- Citrullus vulgaris* Schrad. Watermelon.  
*Pratylenchus brachyurus*
- Citrus limon* (L.) Burm. f. (rough lemon) and/or *C. sinensis* Osbeck (sweet orange).  
*Criconema australe* *Psilenchus tumidus*  
*Criconema civellae* *Radopholus inequalis*  
*Criconemoides ornatum* *Rotylenchus brevicaudatus*  
*Deladenus durus* *Telotylenchus hastulatus*  
*Helicotylenchus dihystra* *Trichodorus minor*  
*Hemicriconemoides cocophillus* *Tylenchorhynchus martini*  
*Hemicycliophora nudata* *Tylenchulus semipenetrans*  
*Hemicycliophora truncata* *Tylenchus costatus*  
*Pratylenchus brachyurus* *Tylenchus exiguus*  
*Pratylenchus zeae* *Tylenchus polyhyphnus*  
*Pseudhalenchus anchilisposomus* *Xiphinema americanum*  
*Pseudhalenchus minutus* *Xiphinema diversicaudatum*  
*Psilenchus gracilis* *Xiphinema elongatum*  
*Psilenchus magnidens*
- Citrus reticulata* Blanco. Mandarin varieties (cultivars) Emperor and Cleopatra.  
*Hemicycliophora nudata*
- Clerodendrum splendens* G. Don. A clerodendrum.  
*Meloidogyne incognita*

- Coleus blumei* Benth. Coleus.  
*Helicotylenchus dihystra*
- Coronopus didymus* (L.) Sm. Bittercress.  
*Pratylenchus coffeae*
- Crassocephalum crepidioides* Benth. Thickhead.  
*Meloidogyne javanica javanica*
- Crotalaria goreensis* Guill. & Perr. Gambia pea  
*Meloidogyne hapla*
- Cucumis melo* L. var. *reticulatus* Naud. Rockmelon.  
*Helicotylenchus dihystra*
- Cucumis sativus* L. Cucumber.  
*Helicotylenchus dihystra* *Paraphelenchus pseudoparietinus*
- Cucurbita maxima* Duchesne. Pumpkin.  
*Pratylenchus brachyurus* *Tylenchorhynchus capitatus*
- Cucurbita pepo* L. var. *medullosa* Alef. Marrow.  
*Rotylenchus brevicaudatus*
- Cupaniopsis anacardioides* (A. Rich.) Radlk. Cupania tree.  
*Pseudhalenchus anchilisposomus* *Telotylenchus hastulatus*
- Cupressus sempervirens* L. var. *stricta* Ait. Pencil pine.  
*Trichodorus porosus*
- Cyamopsis tetragonoloba* (L.) Taub. Guar bean.  
*Meloidogyne javanica javanica* *Scutellonema brachyurum*
- Cyclamen persicum* Mill. Cyclamen.  
*Helicotylenchus dihystra*
- Cydonia oblonga* Mill. Quince.  
*Pratylenchus coffeae*
- Cynodon dactylon* (L.) Pers. Couch.  
*Pratylenchus coffeae*
- Cyperus rotundus* L. Nut grass.  
*Pratylenchus brachyurus* *Rotylenchus brevicaudatus*
- Daucus carota* L. Carrot.  
*Helicotylenchus dihystra*
- Desmodium uncinatum* DC. A tick trefoil.  
*Meloidogyne javanica javanica* *Radopholus similis*
- Dianthus caryophyllus* L. Carnation.  
*Helicotylenchus dihystra* *Tylenchorhynchus capitatus*  
*Meloidogyne incognita* *Tylenchus exiguus*  
*Scutellonema brachyurum*
- Digitaria adscendens* (H.B.K.) Henrard. Summer grass.  
*Pratylenchus coffeae* *Tylenchus discrepans*  
*Tylenchus baloghi*

- Digitaria didactyla* Willd. Queensland blue couch.  
*Criconema australe* *Psilenchus tumidus*  
*Criconemoides mutabile* *Rotylenchus brevicaudatus*  
*Criconemoides ornatum* *Trichodorus minor*  
*Helicotylenchus dihystra* *Tylenchus baloghi*  
*Hemicriconemoides obtusus* *Tylenchus discrepans*  
*Pratylenchus zaeae* *Tylenchus exiguus*  
*Pseudhalenchus minutus* *Xiphinema elongatum*
- Dolichos lablab* L. Tonga or hyacinth bean.  
*Helicotylenchus dihystra* *Meloidogyne javanica javanica*  
*Meloidogyne hapla* *Pratylenchus brachyurus*  
*Meloidogyne incognita*
- Echinochloa crus-galli* var. *frumentacea* (Roxb.) Wight. White panicum.  
*Meloidogyne javanica javanica*
- Entolasia stricta* (R. Br.) Hughes  
*Hemicycliophora labiata*
- x *Eucalyptus acmenioides* Schau. Yellow stringybark.  
*Fergusobia tumefaciens*
- Eucalyptus crebra* F. Muell. Narrow-leaved ironbark.  
*Fergusobia tumefaciens*
- Eucalyptus drepanophylla* F. Muell. ex Benth. Grey ironbark.  
*Fergusobia tumefaciens*
- Eucalyptus hemiphloia* F. Muell. ex Benth. Gum-topped box.  
*Fergusobia tumefaciens*
- Eucalyptus intermedia* F. Muell. Pink bloodwood.  
*Fergusobia tumefaciens*
- Eucalyptus maculata* Hook. Spotted gum.  
*Pratylenchus brachyurus*
- Eucalyptus melanophloia* F. Muell. Silver-leaf ironbark.  
*Fergusobia tumefaciens*
- Eucalyptus micrantha* DC. Scribbly gum.  
*Radopholus inequalis*
- Eucalyptus pilularis* Sm. Blackbutt.  
*Hemicycliophora truncata*
- Eucalyptus populnea* F. Muell. Poplar box.  
*Fergusobia tumefaciens*
- Eucalyptus resinifera* Sm. Red stringybark.  
*Telotylenchus whitei*
- Eucalyptus tereticornis* Sm. Blue gum.  
*Fergusobia tumefaciens*
- Eucalyptus tessellaris* F. Muell. Moreton Bay ash.  
*Fergusobia tumefaciens*

- Ficus carica* L. Cultivated fig.  
*Tylenchus costatus* *Tylenchus exiguus*
- Ficus macrophylla* Desf. Moreton Bay fig.  
*Meloidogyne javanica javanica*
- Ficus opposita* Miq. A sandpaper fig.  
*Tylenchus emarginatus*
- Fragaria X ananassa* Duchesne. Strawberry.  
*Helicotylenchus dihystra* *Scutellonema brachyurum*  
*Pratylenchus brachyurus* *Trichodorus minor*  
*Pratylenchus vulnus* *Tylenchorhynchus capitatus*  
*Pratylenchus zaeae* *Tylenchus polyhypnus*  
*Pseudhalenchus minutus* *Xiphinema elongatum*  
*Rotylenchus brevicaudatus*
- Gahnia clarkei* Benl  
*Dolichodorus obtusus* *Hemicycliophora nudata*
- Gerbera jamesonii* Bolus. Gerbera.  
*Helicotylenchus dihystra* *Pseudhalenchus anchilispomus*  
*Pratylenchoides crenicauda*
- Glycine max* (L.) Merr. Soybean.  
*Meloidogyne javanica javanica*
- Helianthus annuus* L. Sunflower.  
*Pratylenchus brachyurus*
- Hibiscus schizopetalus* Hook. f. Hibiscus.  
*Meloidogyne incognita*
- Hodgkinsonia frutescens* C. T. White  
*Criconema octangulare* *Tylenchulus obscurus*  
*Criconemoides limitaneum* *Tylenchus exiguus*
- Hordeum vulgare* L. Barley.  
*Helicotylenchus dihystra*
- Hornstedtia scottiana* (F. Muell.) K. Schum. A wild ginger.  
*Criconemoides ornatum* *Pratylenchus brachyurus*
- Hornstedtia* sp. A wild ginger.  
*Helicotylenchus dihystra*
- Hypochoeris radicata* L. Flatweed.  
*Pratylenchus coffeae*
- Imperata cylindrica* (L.) Beauv. var. *major* (Nees) C. E. Hubbard. Blady grass.  
*Criconema australe* *Helicotylenchus dihystra*
- Juglans regia* L. English walnut.  
*Pratylenchus coffeae*
- Kochia tomentosa* (Moq.) F. Muell.  
*Stictylus asymmetricus* *Telotylenchus whitei*



- Lactuca sativa* L. Lettuce.  
*Helicotylenchus dihystra* *Scutellonema brachyurum*  
*Pratylenchus zeae* *Tylenchus exiguus*
- Lantana camara* L. Lantana.  
*Helicotylenchus dihystra*
- Lantana montevidensis* (Spreng.) Briq. Creeping lantana.  
*Meloidogyne incognita*
- Linum usitatissimum* L. Linseed.  
*Pratylenchus coffeae*
- Lolium perenne* L. Perennial ryegrass.  
*Pratylenchus zeae*
- Lolium rigidum* Gaud. Wimmera ryegrass.  
*Pratylenchus coffeae*
- Lotononis bainesii* Bak.  
*Helicotylenchus dihystra* *Meloidogyne hapla*
- Lupinus angustifolius* L. New Zealand blue lupin.  
*Helicotylenchus dihystra* *Pratylenchus zeae*  
*Pratylenchus brachyurus* *Tylenchus costatus*  
*Pratylenchus coffeae*
- Lycopersicon esculentum* Mill. Tomato.  
*Helicotylenchus dihystra* *Rotylenchus brevicaudatus*  
*Hemicycliophora truncata* *Scutellonema brachyurum*  
*Pratylenchus brachyurus* *Trichodorus minor*  
*Pratylenchus coffeae* *Tylenchorhynchus capitatus*  
*Pseudhalenchus anchilisposomus* *Tylenchus exiguus*  
*Rotylenchulus reniformis* *Tylenchus polyhyppus*
- Macadamia tetraphylla* L. A. S. Johnson. A Macadamia or Queensland nut.  
*Helicotylenchus dihystra* *Xiphinema americanum*
- Malus sylvestris* (L.) Mill. Apple.  
*Pratylenchus coffeae* *Trichodorus minor*  
*Psilenchus magnidens* *Tylenchus costatus*
- Mangifera indica* L. Mango.  
*Pratylenchus zeae* *Tylenchus leptosoma*  
*Rotylenchulus reniformis*
- Medicago denticulata* Willd. Burr medic.  
*Pratylenchus brachyurus*
- Medicago sativa* L. Lucerne.  
*Criconema australe* *Pratylenchus zeae*  
*Helicotylenchus dihystra* *Rotylenchus bravicaudatus*  
*Hemicycliophora labiata* *Trichodorus minor*  
*Paurodontus apiticus* *Tylenchus emarginatus*  
*Pratylenchus brachyurus* *Xiphinema elongatum*

- Melastoma polyanthum* Blume. Blue tongue.  
*Boleodorus volutus* *Xiphinema radicolica*
- Melinis minutiflora* Beauv. Molasses grass.  
*Helicotylenchus dihystra* *Meloidogyne javanica javanica*
- Musa banksii* F. Muell. A wild banana.  
*Helicotylenchus multicinctus* *Trichodorus minor*  
*Radopholus similis* *Tylenchus exiguus*
- Musa hillii* F. Muell. A wild banana.  
*Helicotylenchus multicinctus*
- Musa* spp. Banana varieties (cultivars) Cavendish, Lady Finger and Williams Hybrid.  
*Criconemoides mutabile* *Pratylenchus coffeae*  
*Deladenus durus* *Radopholus similis*  
*Helicotylenchus dihystra* *Scutellonema brachyurum*  
*Helicotylenchus multicinctus* *Trichodorus minor*  
*Hemicycliophora ovata* *Tylenchus discrepans*  
*Meloidogyne incognita* *Tylenchus exiguus*  
*Pratylenchus brachyurus* *Tylenchus leptosoma*
- Nicotiana tabacum* L. Tobacco.  
*Meloidogyne arenaria thamesi* *Pratylenchus zeae*  
*Paratylenchus projectus* *Trichodorus minor*  
*Pratylenchus brachyurus* *Tylenchus baloghi*
- Olea europaea* L. Olive.  
*Pratylenchus coffeae* *Tylenchulus semipenetrans*
- Opuntia* sp. A prickly pear.  
*Helicotylenchus dihystra* *Tylenchus emarginatus*  
*Hemicriconemoides chitwoodi* *Xiphinema diversicaudatum*  
*Pseudhalenchus minutus*
- Ornithopus sativus* Brot. Serradella.  
*Trichodorus minor*
- Pandanus* sp. Pandanus or screw pine.  
*Pseudhalenchus anchilisposomus*
- Panicum maximum* Jacq. Guinea grass.  
*Boleodorus thylactus* *Rotylenchus brevicaudatus*  
*Pratylenchus zeae*
- Paspalum dilatatum* Poir. Paspalum.  
*Helicotylenchus dihystra* *Xiphinema radicolica*  
*Tylenchus exiguus*
- Paspalum scrobiculatum* L. Scrobic.  
*Pratylenchus brachyurus*
- Passiflora edulis* Sims forma *edulis*. Passionfruit.  
*Helicotylenchus dihystra* *Tylenchus polyhypnus*  
*Scutellonema brachyurum*

- Persea americana* Mill. Avocado.  
*Meloidogyne hapla*  
*Pratylenchus brachyurus*  
*Trichodorus porosus*  
*Xiphinema americanum*  
*Xiphinema elongatum*
- Petunia* × *hybrida* Vilm. Petunia.  
*Helicotylenchus dihystra*
- Phaseolus atropurpureus* DC. Sirato.  
*Helicotylenchus dihystra*
- Phaseolus mungo* L. Mung bean.  
*Pratylenchus brachyurus*  
*Radopholus similis*
- Phaseolus vulgaris* L. French bean.  
*Helicotylenchus dihystra*  
*Meloidogyne arenaria thamesi*  
*Pratylenchus coffeae*  
*Pratylenchus zeae*  
*Tylenchus exiguus*
- Pilidiostigma tropicum* L.S.Smith  
*Helicotylenchus erythrinae*
- Pinus elliottii* Engelm. Slash pine.  
*Boleodorus thylactus*  
*Criconema pectinatum*  
*Graciliacus peperpotti*  
*Pseudhalenchus minutus*  
*Telotylenchus whitei*  
*Trichodorus minor*  
*Tylenchus emarginatus*
- Pisum arvense* L. Field pea.  
*Meloidogyne javanica javanica*
- Pisum sativum* L. Garden pea.  
*Helicotylenchus dihystra*  
*Meloidogyne incognita*  
*Paurodontus apiticus*  
*Pratylenchus coffeae*  
*Trichodorus minor*  
*Tylenchus exiguus*
- Plantago major* L. Larger plantain.  
*Helicotylenchus dihystra*  
*Meloidogyne hapla*  
*Tylenchorhynchus capitatus*
- Portulaca oleracea* L. Pigweed.  
*Aphelenchoides subtenuis*  
*Tylenchus discrepans*  
*Tylenchus polyhypnus*
- Prunus armeniaca* L. Apricot.  
*Pratylenchus coffeae*  
*Pratylenchus neglectus*  
*Scutellonema brachyurum*
- Prunus persica* (L.) Batsch. Peach.  
*Hemicycliophora truncata*  
*Pratylenchus brachyurus*  
*Pratylenchus coffeae*  
*Pratylenchus zeae*  
*Pseudhalenchus anchilisposomus*  
*Scutellonema brachyurum*  
*Tylenchus costatus*  
*Xiphinema americanum*

- Prunus persica* (L.) Batsch. var. *nectarina* Maxim. Nectarine.  
*Helicotylenchus dihyстера*
- Prunus salicina* Lindl. Japanese plum.  
*Pratylenchus coffeae*
- Pyrus communis* L. Pear.  
*Pratylenchus coffeae*
- Reinwardtia indica* Dum.  
*Meloidogyne incognita*
- Rosa multiflora* Thunb.  
*Meloidogyne hapla*
- Rumex acetosella* L. Sorrel.  
*Pratylenchus coffeae*
- Saccharum officinarum* L. Sugar cane.  
*Helicotylenchus dihyстера* *Rotylenchus brevicaudatus*  
*Hemicriconemoides obtusus* *Trichodorus minor*  
*Pratylenchus brachyurus* *Trichodorus porosus*  
*Pratylenchus zae* *Tylenchorhynchus martini*  
*Psilenchus magnidens* *Xiphinema elongatum*
- Samanea saman* (Jacq.) Merr. Rain-tree.  
*Meloidogyne javanica javanica*
- Secale cereale* L. Rye.  
*Helicotylenchus dihyстера* *Trichodorus minor*  
*Meloidogyne javanica javanica*
- Sechium edule* Sw. Choko.  
*Pratylenchus zae*
- Sesbania aculeata* Pers. Sesbania pea.  
*Trichodorus minor*
- Solanum pseudocapsicum* L. Madeira winter cherry.  
*Meloidogyne javanica javanica* *Trichodorus minor*
- Solanum tuberosum* L. Potato.  
*Helicotylenchus dihyстера* *Pratylenchus coffeae*  
*Pratylenchus brachyurus* *Tylenchorhynchus capitatus*
- Sonchus oleraceus* L. Common sowthistle.  
*Pratylenchus coffeae*
- Sorghum bicolor* (L.) Moench. Sweet sorghum.  
*Helicotylenchus dihyстера* *Pratylenchus zae*  
*Meloidogyne javanica javanica*
- Sorghum sudanense* (Piper) Stapf. Sudan grass.  
*Helicotylenchus dihyстера* *Radopholus similis*  
*Meloidogyne javanica javanica*

- Spergula arvensis* L. Corn spurry.  
*Meloidogyne incognita* *Pratylenchus coffeae*  
*Meloidogyne javanica javanica*
- Stizolobium* spp. Velvet beans.  
*Helicotylenchus dihystra* *Radopholus similis*  
*Pratylenchus brachyurus*
- Streptosolen jamesonii* (Benth.) Miers. Browallia.  
*Meloidogyne incognita*
- Stylosanthes gracilis* H.B.K. Stylo.  
*Meloidogyne hapla*
- Stylosanthes humilis* H.B.K. Townsville lucerne.  
*Meloidogyne javanica javanica* *Radopholus similis*
- Tapeinocheilos queenslandiae* (F. M. Bail.) K. Schum.  
*Helicotylenchus dihystra*
- Themeda australis* (R. Br.) Stapf. Kangaroo grass.  
*Criconemoides macrodorum* *Paratylenchus microdorus*  
*Hemicriconemoides obtusus* *Psilenchus hilarulus*  
*Hemicycliophora labiata* *Tylenchus emarginatus*  
*Hemicycliophora truncata*
- Trifolium baccarinii* Chiov.  
*Meloidogyne hapla* *Meloidogyne incognita*
- Trifolium burchellianum* Ser. ex DC. Cape clover.  
*Meloidogyne hapla* *Meloidogyne javanica javanica*  
*Meloidogyne incognita*
- Trifolium fragiferum* L. Strawberry clover.  
*Meloidogyne incognita* *Meloidogyne javanica javanica*
- Trifolium glomeratum* L. Clustered clover.  
*Meloidogyne hapla* *Meloidogyne javanica javanica*  
*Meloidogyne incognita*
- Trifolium hybridum* L. Alsike clover.  
*Meloidogyne hapla* *Meloidogyne javanica javanica*
- Trifolium pratense* L. Red clover.  
*Meloidogyne incognita* *Pratylenchus brachyurus*  
*Meloidogyne javanica javanica* *Pratylenchus coffeae*
- Trifolium repens* L. White clover  
*Helicotylenchus dihystra* *Psilenchus magnidens*  
*Heterodera trifolii* *Scutellonema brachyurum*  
*Meloidogyne hapla* *Trichodorus minor*  
*Meloidogyne incognita* *Tylenchorhynchus striatus*  
*Meloidogyne javanica javanica* *Tylenchus discrepans*  
*Pratylenchus brachyurus* *Tylenchus exiguus*  
*Pseudhalenchus anchilisposomus* *Tylenchus leptosoma*  
*Psilenchus duplexus* *Tylenchus thornei*  
*Psilenchus hilarulus* *Xiphinema radicumicola*

- Trifolium rueppellianum* Fresen.  
*Meloidogyne hapla* *Meloidogyne javanica javanica*  
*Meloidogyne incognita*
- Trifolium semipilosum* Fresen.  
*Meloidogyne hapla* *Meloidogyne javanica javanica*  
*Meloidogyne incognita*
- Trifolium subterraneum* L. Subterranean clover.  
*Meloidogyne incognita* *Pratylenchus zeae*  
*Meloidogyne javanica javanica* *Rotylenchus brevicaudatus*
- Trifolium tembense* Fresen.  
*Meloidogyne incognita* *Meloidogyne javanica javanica*
- Trifolium usambarense* Taub.  
*Meloidogyne incognita* *Meloidogyne javanica javanica*
- Triticum aestivum* L. Wheat.  
*Helicotylenchus dihystra* *Tylenchus exiguus*  
*Meloidogyne javanica javanica*
- Verbena bonariensis* L. Purple-top.  
*Pratylenchus coffeae*
- Vicia sativa* L. Common vetch.  
*Meloidogyne javanica javanica* *Paratylenchus projectus*
- Vigna sinensis* (L.) Endl. ex Hassk. Cowpea.  
*Meloidogyne incognita* *Pratylenchus coffeae*  
*Pratylenchus brachyurus*
- Vitis vinifera* L. Grape.  
*Boleodorus thylactus* *Rotylenchus brevicaudatus*  
*Criconemoides xenoplax* *Scutellonema brachyurum*  
*Helicotylenchus dihystra* *Trichodorus minor*  
*Hemicyclophora truncata* *Trichodorus porosus*  
*Paratylenchus elachistus* *Tylenchulus semipenetrans*  
*Paratylenchus projectus* *Tylenchus costatus*  
*Paurodontus densus* *Tylenchus emarginatus*  
*Pratylenchus coffeae* *Tylenchus exiguus*  
*Pratylenchus zeae* *Tylenchus polyhypnus*  
*Pseudhalenchus anchilisposomus* *Xiphinema americanum*  
*Pseudhalenchus minutus*
- Zea mays* L. Maize.  
*Helicotylenchus dihystra* *Radopholus similis*  
*Pratylenchus brachyurus* *Rotylenchulus parvus*  
*Psilenchus magnidens* *Tylenchus exiguus*
- Zingiber officinale* Rosc. Ginger.  
*Meloidogyne javanica javanica*

#### IV. DISCUSSION

There are still many undescribed species in the Departmental Nematology Collection. The data in this paper, however, demonstrate that plant-parasitic nematodes are well represented in Queensland soils and there are many associations meriting investigation.

Galling of citrus roots at Burrum by *Hemicycliophora nudata* suggests that other native species may become pests of cultivated crop plants.

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