

of the patent period. It is believed that the drop in the curve was primarily indicative of the length of life of the worm rather than the development of immunity in the host, for almost the same curve, with a slightly lower peak, as was obtained in first infections was repeated in second infections immediately following the loss of mild first infections. In 10 cases of single inoculation with an average of 1,840 larvae, the period of patency averaged about 117 days. This is sufficient time to maintain the species while conditions are inimical to life on the pasture.

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***Pratylenchus vulnus*, new species (Nematoda: Pratylenchinae),
a Parasite of Trees and Vines in California**

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The nematode genus *Pratylenchus* Filipjev 1934 contains a number of plant parasitic species that are commonly referred to as meadow or root-lesion nematodes. The latter name is commonly used in California because it is descriptive of the root symptoms observed on several of the crop plants that are attacked in the State. Root-lesion nematodes have been recognized as parasites of figs in California since 1927. However, fig trees having the typical symptoms that are now associated with root-lesion nematodes were observed as early as 1920. Since that time several investigators have observed and reported these nematodes on various hosts in many localities in the State.

Identification of species in the genus *Pratylenchus* has for many years been a difficult task due to the fact that certain of the original species descriptions were inadequate. Most workers who have examined specimens of the genus *Pratylenchus* from California have identified them as being either *P. pratensis* (de Man) or *P. musicola* (Cobb). *P. musicola* was identified by G. Steiner in 1927 from the roots of grape (*Vitis vinifera*) collected near Loomis, California. Also in 1927, specimens collected from the roots of mission fig near Merced were identified by N. A. Cobb as *P. pratensis*. Gerald Thorne in 1934 reported *P. pratensis* as a parasite of fig. Ark and Thomas (1936) indicated that *P. pratensis* was the species attacking apples in the Sebastopol area and listed as additional hosts plum, peach, pear, and grape. Condit and Horne (1939) recorded damage to olive roots near Riverside to be caused by *P. musicola*. Allen (1949) reported that walnuts throughout the State were frequently damaged by the attack of a species of *Pratylenchus*.

A careful examination of specimens collected from the above-mentioned hosts and in many localities in California over a period of several years indicates that

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one species predominates as an important crop pest. Several other species of the genus have been found occasionally but are at present known only from a few hosts and localities. Comparison with specimens of *P. pratensis*, *P. musicola* and other described species of the genus has shown that the root-lesion nematode commonly found injuring trees and vines in California is an undescribed species. It is proposed that the species be named *Pratylenchus vulnus*, new species.

Pratylenchus vulnus, new species

♀: L=0.46-0.91 mm; a=26.6-39.5; b=5.3-7.7; c=14.2-27.7; V=78-84.1%.

♂: L=0.46-0.73 mm; a=28.3-39.2; b=5.3-7.4; c=17.5-29.4; T=35.8-66; gub=4-6 μ; spicule=14-20 μ.

Female.—Cuticle marked by distinct transverse striae averaging about 1 μ apart except in neck and tail where striae may be nearly 2 μ apart. Wing area composed of three elements marked by four incisures (Fig. 1, E and I), the outer ones noticeably crenate. Lip region almost continuous with body contour; marked by two or three striae which form three or four annules (Fig. 1, B and C). In face view six sectors of the lip region are visible, the lateral lips are distinctly wider than the submedians (Fig. 1, D). Papillae very obscure. Amphid apertures located near outer margin of lateral lips. Spear 16 to 18 μ long with well developed conspicuous basal knobs. Wide muscular bands connect spear base with the heavily sclerotized labial framework.

Dorsal esophageal gland orifice located about 3 μ behind spear base. Median esophageal bulb slightly ovate, equipped with a refractive valvular apparatus. Nerve ring surrounding esophagus just behind median bulb. Esophagus extending about 2 body widths beyond median bulb. Esophageal glands forming a large lobe overlapping the anterior end of the intestine. Three esophageal nuclei are usually visible. Excretory pore located about 2 body widths behind median bulb.

Anterior branch of female reproductive system composed of a short uterus, cellular oviduct and outstretched ovary made up of a series of developing oocytes arranged in a single file except for a short region of reproduction near anterior end. Ovary frequently extending to the vicinity of the esophageal glands. Posterior uterine branch extending one-fourth to one-half the distance to anal opening. Posterior branch composed of a short extension of the uterus and a short vestigial ovary. Vestigial ovary obscure, but readily seen in stained specimens. Phasmid openings slightly posterior to middle of tail. The four incisures extend beyond the phasmids almost to terminus of tail (Fig. 1, E and F). Striae of cuticle not extending around terminus of tail.

Male.—Lip region continuous with neck contour, marked by two or three striae which form three or four annules. Spear 15 to 18 μ long, labial framework, and esophagus similar to that of female. Phasmids located slightly posterior to middle of tail, extending into bursa (Fig. 1, H); opening short of the margin of the bursa. In cross-section tail ventrally flattened posterior to anal opening. Single testis made up of developing spermatocytes usually arranged in two rows. Length of testis variable, sometimes extending to vicinity of the esophageal glands. Spicula arcuate, hafted, about 17 μ long. Gubernaculum slightly arcuate, about 5 μ long (Fig. 1, G).

Type host.—California black walnut, *Juglans hindsii* Jepson

Type locality.—San Jose, California

Host Plants.—Walnut, grape, fig, citrus, apricot, avocado, weeping willow, cherry, olive, peach, almond, plum, raspberry and boysenberry.

Diagnosis.—Plant parasitic *Pratylenchus* with the above measurements and general description. Lip region bearing two or three striae forming three or four

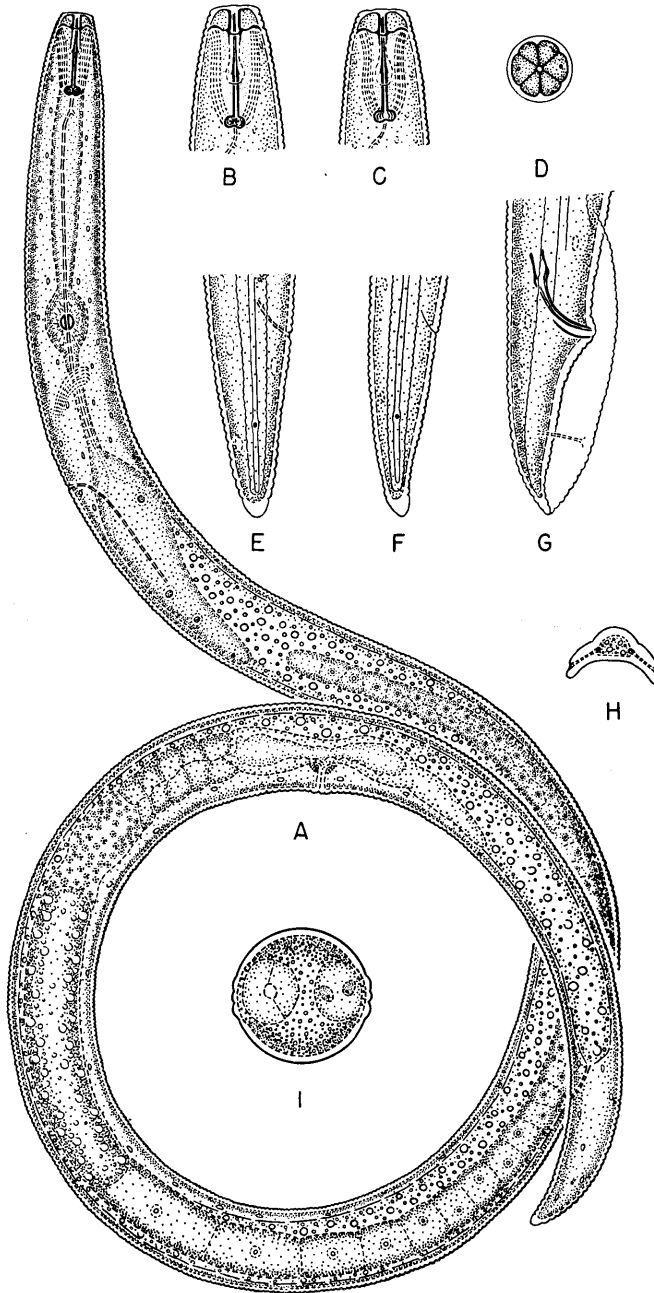


FIG. 1. *Pratylenchus vulnus*, n. sp. A—Adult female, $\times 650$. B, C—Heads of females, $\times 1000$. D—Face view of female, $\times 1000$. E, F—Female tails $\times 1000$. G—Male tail, $\times 1000$. H—Diagrammatic cross-section thru male tail, $\times 1000$. I—Cross-section thru female body, $\times 1000$.

annules. The number of annules on the lip region appears to be variable in *P. vulnus*. Males and females in the same root-lesion frequently show variation in the number of annules on the lips. This variation has been observed in both living and fixed material. Lateral field marked by four incisures. In the female all four incisures extend almost to the terminus of the tail. Lateral striae not extending around female tail. Gubernaculum crescent shaped in lateral view.

Pratylenchus vulnus, n. sp. most closely resembles *P. pratensis* and *P. musicola*. It can be distinguished from *P. pratensis* by the following morphological differences; absence of striae around the female tail, four incisures extending posterior to phasmid in female. *P. vulnus* differs from *P. musicola* in having a longer posterior uterine branch and in having three or four annules on the lip region. Specimens of *P. musicola* from the collection of Gerald Thorne, Division of Nematology, Salt Lake City, Utah were found to have four annules on the lip region and the post-uterine branch extending less than one-fourth the distance to the anal opening.

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Notes on Caricide as an Anthelmintic for Cats and Dogs

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Following the initial reports of Hewitt and his co-workers (1947. J. Lab. and Clin. Med. 32: 1304-1313; *ibid.*: 1314-1329) on the use of caricide (1-diethylcarbamyl-4-methylpiperazine dihydrogen citrate) for the treatment of filarial infections in cotton rats and dogs, the chemical has been tested or used in a wide variety of helminthic infections of both man and animals. In trials reported by these investigators, caricide elicited no acute toxic reactions and there was no evidence of chronic toxicity in dogs that were given multiple daily doses of the drug for more than two months. In June, 1948, Hewitt et al (J. Parasitol. 34: 237-239) reported that caricide exhibited marked ascaricidal action in dogs, but that it was ineffective against hookworms, whipworms, and tapeworms. The chemical was given in several different dosages and by various methods of administration. At a dose rate of 25 mg. per kg. of body weight, the drug removed 65 per cent (25) of 38 ascarids from 7 dogs; and when the dosage was increased to 50 mg. per kg., the chemical removed 98 per cent (72) of 73 ascarids from 10 dogs. Complete removal of large roundworms was obtained when these dosages were given twice within 24 hours, and the larger dosage was wholly effective also when given intraperitoneally in this manner. About half of the animals vomited after treatment, but there were no other symptoms attributable to the drug. Six months later, Kanegis (1948. J. Am. Vet. Med. Assn. 113: 579-581) published data on the use of caricide for the removal of ascarids from cats. The most satisfactory