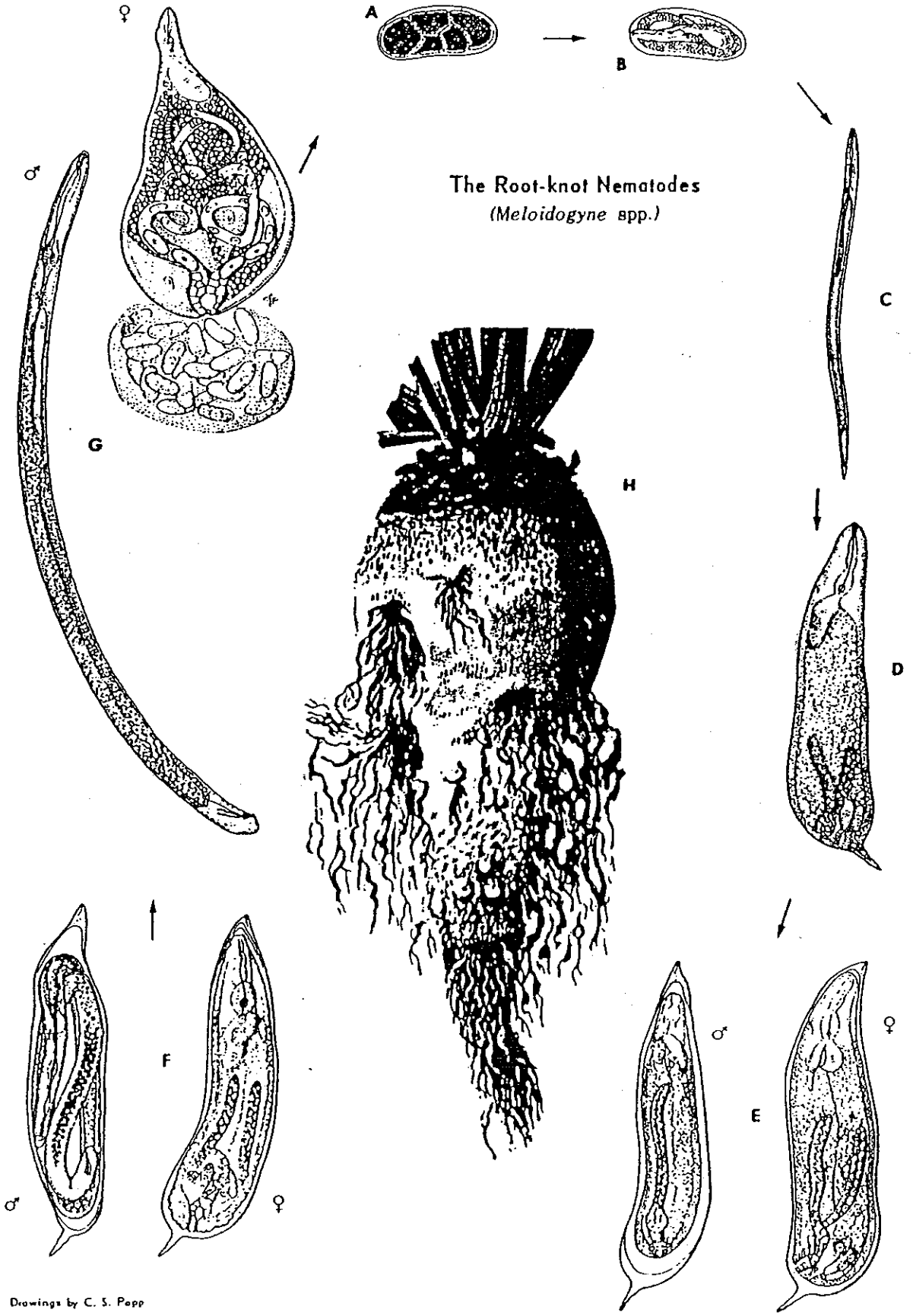

Drawings by C. S. Papp

Table 1. Usual response of the four common *Meloidogyne* species and their races to the North Carolina Differential Host Test.

Meloidogyne species and physiological races	Differential Host Plants*					
	Cotton	Tobacco	Pepper	Watermelon	Peanut	Tomato
M. incognita						
Race 1	−	−	+	+	−	+
Race 2	−	+	+	+	−	+
Race 3	+	−	+	+	−	+
Race 4	+	+	+	+	−	+
M. arenaria						
Race 1	−	+	+	+	+	+
Race 2	−	+	−	+	−	+
M. javanica	+	+	−	+	−	+
M. hapla	−	+	+	−	+	+

*Cotton, Deltapine 61; tobacco, NC 95; pepper, Early California Wonder; watermelon, Charleston Gray; peanut, Florunner; tomato, Rutgers; (−) indicates a resistant host; (+), a susceptible host.

Initiation of the Differential Host Test

1. Transplant three healthy seedlings (2- to 4-true-leaf stage) of each of the following cultivars into 10-cm pots with a sterile soil mixture: tomato 'Rutgers,' tobacco 'NC 95,' pepper 'Early California Wonder,' peanut 'Florunner,' watermelon 'Charleston Gray,' and cotton 'Deltapine 61.'
2. Pipette 5 ml of well-stirred inoculum near the base of each plant.
3. Water plants very lightly to wash eggs into the soil. Overwatering may wash the inoculum out of the pot.
4. Allow the plants and nematodes to develop about 60 days.

   Note: The test should be conducted at a temperature range of 24° to 30°C. The resistant reaction of cotton and tobacco is temperature dependent. Therefore, at high temperatures (>30°C), populations of *M. incognita* may be induced to infect one or both of these hosts, and thus the race may be erroneously identified.

Termination and Evaluation of the Differential Host Test

1. Remove plant stem and leaves and gently wash soil free from the root system.
2. If egg masses are quite small or few in number, stain them with a solution of Phloxine B (15 mg/liter of water or 0.0015%, C.I. No. 45410) for 15 to 20 minutes to enhance visibility. The stain is absorbed by the gelatinous matrix surrounding the eggs and gives it a pink to red color. The roots themselves remain unstained or only very [illegible]. Eggs do not absorb the
3. Count the number of galls and the number of egg masses separately for each root system and assign a rating index number according to the scale: 0 = no galls or eggs masses, 1 = 1-2 galls or egg masses, 2 = 3-10, 3 = 11-30, 4 = 31-100, and 5 = over 100 galls or egg masses. Host-plant types that have an average gall and egg mass index of 2 or less are designated resistant (−), provided that the average rating of the 'Rutgers' tomato (susceptible control) is greater than 4. Host plants on which nematode reproduction is moderate to high (that is, those with an average gall and egg mass index greater than 2) are considered to be susceptible (+) (see Tables 1 and 2).

   Note: Females often develop in close proximity to each other, thus forming large compound galls. When galls are counted, the number of females present in large compound galls should be estimated so the actual number of infections will be portrayed more accurately.
4. Remove 15 to 20 separate galls containing single mature females from each infected host type for preparation of perineal patterns. Make one microscope slide of females from each host.

   Note: Unless a single egg mass was used to establish the culture from a field population, a given culture may contain more than one species.

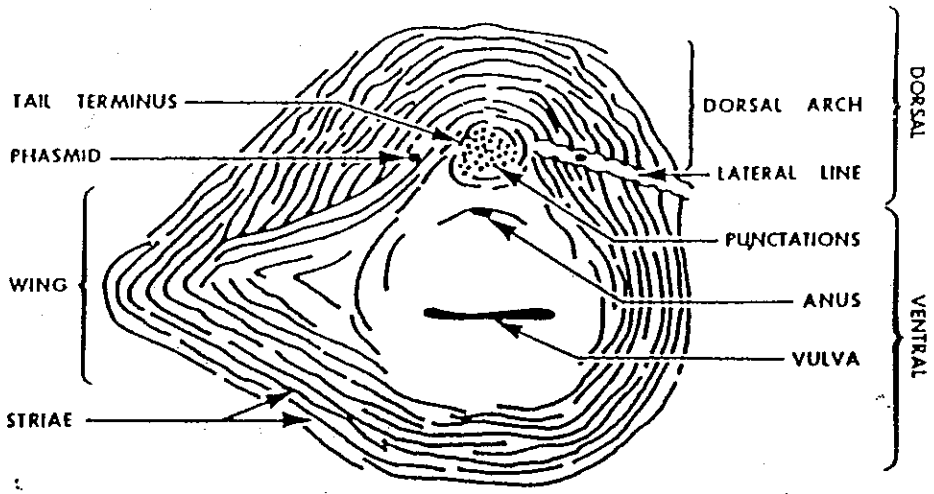

FIGURE 12 Diagram of the perineal pattern of a root-knot nematode, *Meloidogyne* sp. (After Eisenback et al., 1981.)

TABLE 5 Key to the Agriculturally Most Important Root-Knot Nematodes (*Meloidogyne* spp.) Based on Morphology of the Perineal Pattern

1.	Punctations present in tail terminal area	*M. hapla*
1′	Punctations absent in tail terminal area	2
2.	Lateral lines clearly marked by deep incisures; usually extending well beyond perineum	*M. javanica*
2′	Lateral lines not clearly marked or ending near perineum	3
3.	Striae in dorsal arch twisted and fused	*M. chitwoodi*
3′	Striae in dorsal arch not twisted and fused	4
4.	Lateral fields near perineum marked by coarse, raised, looped, and folded striae	*M. exigua*
4′	Lateral fields not marked by looped and folded striae	5
5.	Dorsal arch high and square, striae smooth to wavy	*M. incognita*
5′	Dorsal arch low and rounded	6
6.	Striae near perineum in dorsal arch coarse and thick	*M. artiellia*
6′	Striae near perineum in dorsal arch not coarse and thick	7
7.	Striae in dorsal arch rounded and forming shoulders	*M. arenaria*
7′	Dorsal arch without distinct shoulders	8
8.	Phasmids large	*M. naasi*
8′	Phasmids very small	*M. graminicola*

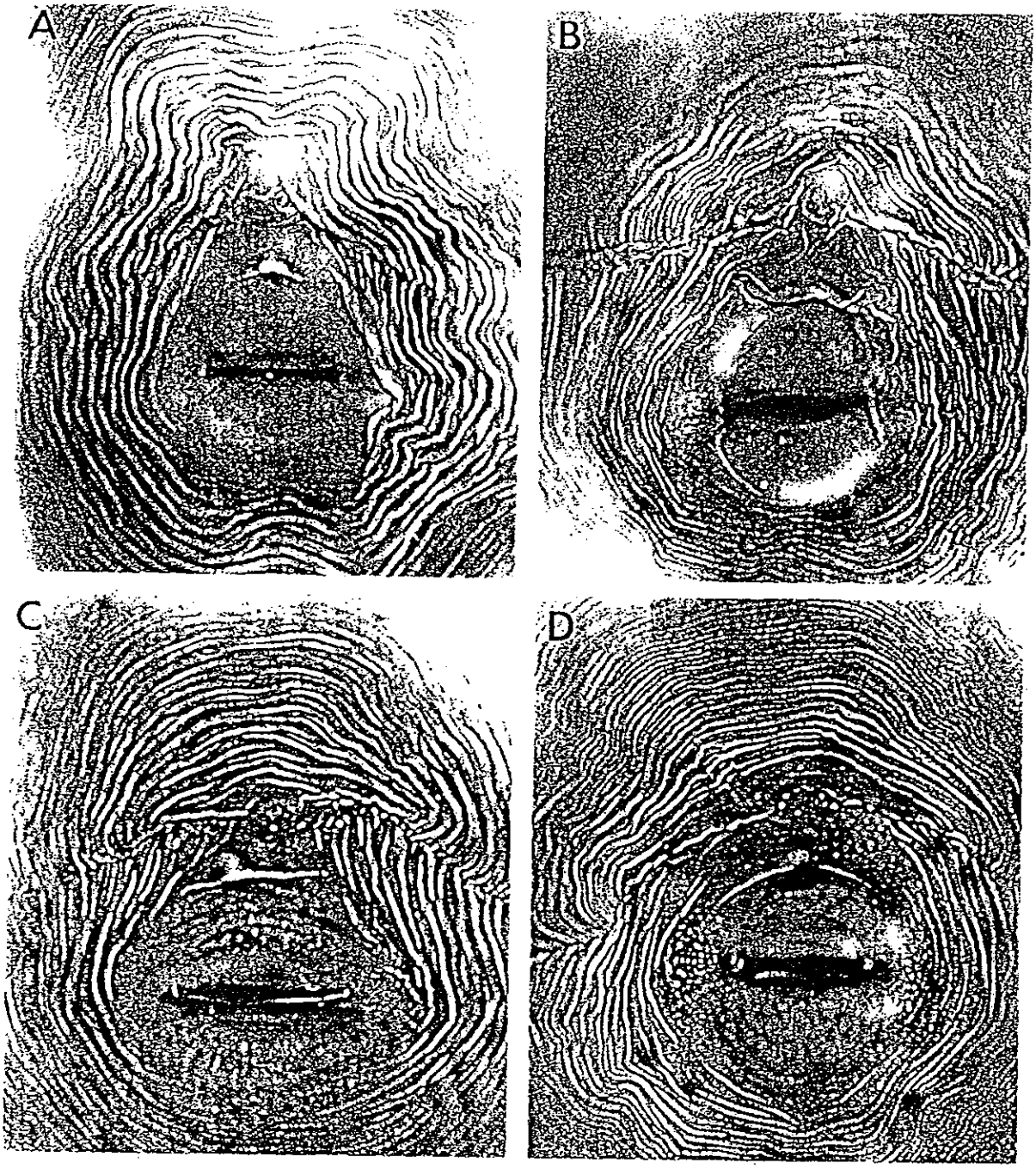

Fig. 2 A-D. Light micrographs of perineal patterns of species of *Meloidogyne*. A) *M. incognita*. B) *M. javanica*. C) *M. arenaria*. D) *M. hapla*. [After J. D. Eisenback et al. (16)].