of the developing spermatids in the testis of a similar male. Both figures clearly show the enclosure of two sperms in a common membrane, a feature which we presume to be responsible for their inability to fertilize the eggs. Axoneme of each sperm comprises 9+9 (doublet) +2 tubules[1] but the associated accessory bodies are absent, contrary to previous reports[2]. The two mitochondrial derivatives surrounding the axoneme have three crystalline bodies each. Characteristic feature of two bridges present between the mitochondrial derivatives and the axonemal microtubules, and ending in typical curved end feet, can be seen in conformation with the observations of Dallai[3] and Afzelius[4]. The 'syncytium' referred to by Bawa[5] prior to the separation of individual spermatids, is not frequent in the normal males. A plausible explanation of the common ensheathment of the two sperms is their inability to get completely separated at the last stage of spermatid development. This is not "conjugation" described for *Dytiscus marginalis*[5] and certain lepismatid insects[5,6] as in these insects the 'conjugating spermatozoa' do not have the common outer membrane. This unusual feature, presumably responsible for sterility, is being reported for the first time in *D. koenigii.*

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OCCURRENCE OF ROOT-KNOT NEMATODE, *MELOIDOGYNE GRAMINICOLA* IN SEMI-DEEP WATER RICE

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THE root-knot nematode, *Meloidogyne graminicola* is a serious pest of nurseries and upland rice[1] resulting in yield losses upto 30%[2]. Besides chemotherapy, water-logging as one of the methods of control for this pest has been recommended[2]. The occurrence of this nematode has been reported from lowland rice[3,4]. During the years 1980–82 kharif seasons, the root-knot nematode damage was observed in semi-deep water rice on this farm.

Based on these observations investigations were conducted on the prevalence and build-up of this nematode in semi-deep water rice under field conditions. Semi-deep water tanks (30 x 30 m) were used for the experimentation. Thirty-day-old seedlings of rice cultures CR.1018 and CN.540 grown in a nursery with a history of root-knot nematode infestation were transplanted. During transplanting, 15 seedlings were randomly sampled and the endoparasitic stages of the nematode were enumerated[5]. The number of adults with eggmasses, adults and other juvenile stages were recorded as 5, 10, and 16.2 in cult. CR.1018 and 10.5, 17 and 22.5 in the cult. CN 540 respectively.

Results indicated a five-fold increase in the nematode population (eggmasses) in both the rice cultures at tillering stage (table 1). However, the build-up of the nematodes was higher in Cult.CN.540 than in CR.1018.

The survival and multiplication of *M. graminicola* either in infected seedlings or in infections from field soil in direct seeded rice under semi-deep water condition was investigated in another experiment. Seeds of rice culture CN.540 (80 kg/ha) were directly sown in the field (24 m^2) sub-plots in four replicates. The initial soil population of *M. graminicola* larvae

Table 1. *Nematode numbers recorded in two rice cultures at maximum tillering stage.*

Developmental stages	CR.1018	CN.540
Adults with eggmasses	32.5	45.3
Adults	15 0	17.0
Juveniles	35.2	49 8

was 7,100 g soil. At the same time seeds were also sown in an upland root-knot nematode infested nursery. The seedlings (30 days old) from this nursery were transplanted into the above semi-deep water field. The seedlings at planting had 6 adults with eggmasses, 15 adults and 19 other juvenile stages.

Observations at the maximum tillering stage revealed 12 eggmasses, 7 adults and 13 juveniles in direct sown rice and 24 eggmasses, 10 adults and 133 juveniles in transplanted rice plots. The low multiplication observed in direct seeded crop could be due to the low initial nematode population.

These results indicate that the root-knot nematode, *M. graminicola* can thrive and infect the rice crop even under semi-deep water conditions. Further, results also suggest that the water logging the infested field may not necessarily control the nematode.

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EFFECT OF LEAF CURL DISEASE ON SEED AND OIL QUALITY OF SESAME (*SESAMUM INDICUM* L)

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LEAF curl incited by tobacco leaf curl virus is a serious disease of sesame (*Sesamum indicum* L.)[1,2]. Since no information was available on the effect of this disease on host metabolism, preliminary investigations were conducted to see the quantitative and qualitative changes in the sesame seed and oil due to the virus infection.

When the crop matured, capsules were collected from healthy and severely infected plants of local sesame paired in terms of age, height, stand density, slope and soil type. Four samples with five pairs in each sample were collected. The seeds of five healthy and five diseased plants of each sample were mixed separately, weighed and the mean yield/plant was computed. Seeds of each sample were analysed for oil[3] and protein[4] contents. The oil obtained from the seeds of each sample was further analysed for fatty acids (oleic, palmitic and lauric acids) and for saponification and iodine values[4].

It is evident from table 1 that plant yield and oil content of seeds were greatly reduced due to the disease, however, protein content of seeds was increased. Analysis of the oil revealed that both saponification and iodine values were decreased and quantities of all the three fatty acids (oleic, palmitic and lauric acids) were increased as a result of infection.

Table 1 *Effect of leaf curl disease on quantity and quality of sesame seed and oil*

Source	Seed yield/plant (g)	Seed analysis		Oil analysis				
		Protein (%)	Oil (%)	Oleic acid (g/1000 g oil)	Palmitic acid (g/1000 g oil)	Lauric acid (g/1000 g oil)	Saponification value	Iodine value
Healthy plant	8.28	21.9	49.1	1.6	1.4	2.0	188.5	110
Leaf curl infected plant	3.64	26.0	46.3	2.4	2.3	2.2	133.2	105

Data represent mean of 4 values