

Sebastian, K.J., 1988. The study of interactions between industrial air pollutants (from Andheri) and pollen physiology. M.Phil. Thesis, University of Bombay.

Sulbha Rane, 1988. The study of interactions between industrial air pollutants (from Lalbaug) and pollen physiology. M. Phil. Thesis, University of Bombay.

OCCURRENCE OF GREAT CRESTED GREBE, *PODICEPS CRISTATUS CRISTATUS* (LINN.) IN KONDAKARLA LAKE, VISAKHAPATNAM DISTRICT, ANDHRA PRADESH

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The Great Crested Grebe *Podiceps cristatus cristatus* (Linnaeus), is a rare winter visitor to Northern India and Pakistan, from Sind to Assam and Manipur. It is known to occur in Rajasthan and Gujarat in the west and Orissa in the east (Ali & Ripley, 1987). Even though this bird was reported earlier in Andhra Pradesh (Krishna Raju, 1983; Taher & Pittie, 1989) at Thadipudi near Visakhapatnam, no recent sight record has been reported.

Our team conducted limnological and biodiversity studies during 1996-1998 on the Kondakarla Lake, which is a natural shallow freshwater lake, situated about 40km southwest of Visakhapatnam city, in between latitudes 17°35'30" and 17°36'02"N and 82°59'27" and 83°01'0"E longitude. On 29th December 1997 the author had an opportunity of observing five Great Crested Grebe on the lake near Gollalapalem area, with large number of other teals like Coot, *Fulica atra* (more than 300), Red Crested Pochard, *Netta rufina* (120*), Shovellers, *Anas clypeata* (60*), Common Pochard, *Aythya ferina* (25*) and other unidentified teals (100*). In a close view with the binoculars, their humpbacked appearance, long slender neck and their striking plumage were immediately recognizable. Interestingly all the grebes were in winter plumage, without long ear tufts, and in bright adult plumage. These birds were seen feeding most of the time in the area, where the submerged macrophytes like *Chara vulgaris* and *Hydrilla verticillate* were in abundance. The next day these birds were observed again near Waadrepally area of the lake.

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References

- Ali, S. & Ripley, S.D. 1989. *Compact Hand Book of the Birds of India and Pakistan*. Oxford University Press, New Delhi.
- Krishnaraju, K.S.R. 1983. On the occurrence of Great Crested Grebe, *Podiceps cristatus cristatus* (Linn.) in Coastal Andhra Pradesh. *J. Bombay Nat. Hist. Soc.*, 81 : 691.
- Taher, S.A. & Pittie, A. 1989. *A Checklist of Birds of Andhra Pradesh*. Andhra Pradesh Bird Watcher's Society, Hyderabad.

EFFECT OF ROOT-KNOT NEMATODE ON WILT OF TOMATO

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The roots of crop plants are constantly exposed to many soil micro-organisms, and infection by one pathogen may alter the host response to subsequent infection by another (Taylor, 1970). *Fusarium solani* causing tomato wilt is one of the most important soil borne organism and its infection causes heavy crop losses. The development of fusarium wilt disease has been reported to be enhanced by the infection of root-knot nematode (Mai & Abawi, 1987). In nature, root-knot nematode *Meloidogyne incognita* and the fungus *F. solani* have been found associated with tomato. In such situation the losses to tomato become much more. It is not known whether there is any relationship between the two organisms. The present investigations are made to determine the relationship between *M. incognita* and *F. solani* on tomato.

The inoculum of the fungus was raised on potato dextrose broth at 28°C (Riker & Riker, 1936). The fungus was grown in 250 ml Erlenmeyer flask and the inoculum was used for inoculation. The plants were inoculated with blended fungal mat @ 2g/pot. The inoculum of root-knot nematode was raised from single eggmass on tomato. The plants were inoculated with 1000 J₂ second stage juveniles.

Table 1. Effect of *M. incognita* and *F. solani* on yield and growth of tomato

Figures in parenthesis show percent reduction over control.

Each reading is mean of three replicates.

Treatments	Plant length cm			Fresh weight g			Dry weight g			Yield kg/plant
	Root	Stem	Total	Root	Stem	Total	Root	Stem	Total	
Control	12.50	40.60	53.10	3.90	7.70	11.60	1.90	3.80	5.70	1.40
<i>M. incognita</i> (Mi)	7.50 (40.00)	24.80 (38.92)	32.30 (39.17)	3.30 (15.30)	5.10 (33.77)	8.40 (27.59)	1.30 (31.58)	2.10 (56.67)	3.40 (40.35)	0.80 (42.86)
<i>F. solani</i> (Fs)	5.30 (57.60)	24.20 (40.39)	29.50 (44.44)	2.50 (35.90)	3.90 (49.35)	6.40 (44.82)	1.10 (42.11)	1.90 (50.00)	3.00 (47.36)	0.90 (35.71)
Simultaneous Inoculation Mi + Fs	3.90 (68.80)	20.50 (49.50)	24.40 (54.05)	1.80 (53.55)	3.00 (61.04)	4.80 (58.62)	0.50 (63.68)	1.30 (65.79)	1.80 (68.42)	0.40 (71.43)
Sequential Inoculation MiaFs	4.90 (60.80)	23.40 (42.36)	28.30 (46.70)	2.00 (48.72)	3.20 (58.00)	5.20 (55.17)	0.90 (52.68)	1.60 (57.89)	2.50 (56.14)	0.60 (57.14)
MibFs	4.60 (63.20)	23.80 (41.38)	28.40 (46.52)	1.90 (51.28)	3.00 (61.04)	4.90 (57.76)	0.70 (63.16)	1.50 (60.53)	2.20 (61.40)	0.50 (64.29)
P=0.05	3.95	9.50	19.95	0.40	0.90	2.75	0.32	0.90	2.10	0.45

The treatments were as follows :

1. Nematode alone (Mi)
2. Fungus alone (Fs)
3. Nematode and fungus inoculated concomitantly (Mi + Fs)
4. Nematode and fungus inoculated sequentially as
 - (i) Nematode one week prior to fungus (Mibfs)
 - (ii) Fungus one week prior to nematode (Miafs).

Growth of plants was recorded as shoot height, fresh and dry weight, root length fresh and dry weight and yield.

The results presented in Table 1 indicate that inoculation of plants with fungus and nematode significantly reduced the growth of plants, as measured in length fresh weight and dry weight. However, the growth was most affected when the plants were inoculated with the two organisms together simultaneously, this was followed by inoculation of plants with nematode prior to fungus. Least damage was observed when plants were inoculated with fungus prior to nematode.

The nematode might have provided avenues for the entrance of the fungus. The probability of predisposition of plants to fungal infection physiologically by nematode

cannot be ruled out (Powell & Nusbaum, 1960). The results are in agreement with those reported in Powell (1963, 1971).

References

- Mai, W.F. & Abawi, G.S. 1987. Interaction among root-knot nematode and Fusarium wilt fungi on host plants. *Ann. Res. Phytopathol.*, 25 : 17-338.
- Powell, N.T. 1963. The role of plant-parasitic Nematodes in fungus diseases. *Phytopathology*, 53: 28-35.
- Powell, N.T. 1971. Interactions between nematodes and fungi in disease complexes. *Annu. Rv. Phytopathology*, 9 : 253-274.
- Powell, N.T. & Nusbaum, C.J. 1960. The black shank root-knot complex in flue-cured tobacco. *Phytopathology*, 50: 899-906.
- Riker, A.J. & Riker, R.S. 1936. Introduction to research on plant diseases. Planographed by John's and Co., St. Louis, M.O.P.: 117.
- Taylor, C.E. 1990. Nematode interactions with other pathogens. *Ann. Appl. Biology*, 116 : 405-416.