as freshly harvested (30-45 days old) or 8 months after harvest registered no variation for its seedling vigour and subsequent production potential under field conditions which were showed by the recorded values of all the parameters that were evaluated (Table 1 & 2).

It is evident from the field experiment that, freshly harvested rice seeds (30-45 days old) from Kar season can be used for the subsequent sowing in the Pishanam season. And hence the farmers of Tambaraparani tract can be advocated to use Kar season seeds for immediate sowing in Pishanam after required seed processing.

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Madras Agric. J., 95 (1-6): 218-222 January-June 2008
https://doi.org/10.29321/MAJ.10.100569

Research Notes

Antibiotics for the management of bacterial fiacherie of silkworm, *Bombyx mori* L

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Supplementation of mulberry leaves with antibiotics *viz*., streptomycin sulphate, gentamycin, cloxocillin and kanamycin at 0.05 and 0.1 per cent concentration resulted in lowering the fiacherie incidence significantly compared to control. (Baig *et al.*, 1990). Sridar *et al.* (2000) reported that, administration of ampicillin @ 500 ppm reduced the incidence of fiacherie from 63 to 39 per cent with an increase in larval weight, cocoon weight,shell weight and shell ratio by 12.0, 13.6, 32 and 1.3 per cent, respectively over the pathogen inoculated larvae. Oral administration of six antibiotics *viz*., ampicillin, amoxycillin, cephalexin, cloxacillin, chloramphenicol and tetracycline in four concentrations of 1.0, 1.5, 2.0 and 2.5 per cent showed a positive impact on larval growth and cocoon characters, besides elevating silk filament length (Savithri *et al.*, 1999).

A study was conducted in the Department of Sericulture, Tamil Nadu Agricultural University, Coimbatore to identify effective antibiotics for the management of flacherie disease in silkworm, *Bombyx mori* L. both by conducting *in vitro* and *in vivo* studies using the isolated *Bacillus thuringiensis* strain, 01-TAD -01.

In vitro effect of antibiotics on the growth of B. thuringiensis strains

Using the filter paper disc diffusion technique, inhibition zones around the discs were measured for determining the antimicrobial activity of the antibiotics. The inhibition ranged

Table 1. *In vivo* efficacy of antibiotics against *B. thuringiensis*

Treatments	Mortality (%) at different concentrations (ppm)		Per cent survival at different concentrations (ppm)	
	500	1000	500	1000
Lincomycin + *B. thuringiensis*	22.67 (28.41)[c]	20.00 (26.57)[c]	68.51[b]	72.20[b]
Doxycycline hydrogen chloride + *B. thuringiensis*	18.67 (25.57)[b]	16.00 (23.47)[b]	74.06[a]	77.77a
Streptomycin + *B. thuringiensis*	21.00 (27.24)[bc]	18.67 (25.57)[bc]	70.83[ab]	74.06[ab]
Erythromycin + *B. thuringiensis*	27.00 (31.30)[d]	24.00 (29.28)[d]	62.50°	66.66[C]
Lincomycin alone	0.00 (0.01)[a]	0.00 (0.01)[a]	-	-
Doxycycline hydrogen chloride alone	0.00 (0.01)a	0.00 (0.01)a	-	-
Streptomycin alone	0.00 (0.01)a	0.00 (0.01)a	-	-
Erythromycin alone	0.00 (0.01)a	0.00 (0.01)a		
Treated control	72.00 (58.09)[a]	72.00 (58.09)[c]	-	-
Untreated control	0.00 (0.01)a	0.00 (0.01)[a]	-	-

Means followed by a common letter(s) are not significantly different by DMRT(P = 0.05).

Figures in parentheses are arc sine transformed values

Table 2. *In vivo* effect of antibiotics on the economic characters of *B. mori* exposed to *B. thuringiensis*

Treatments	Larval weight (g)		Cocoon weight(g)		Shell weight (g)		Shell ratio (%)		Silk filament length (m)	
	500	1000	500	1000	500	1000	500	1000	500	1000
Lincomycin + *B. thuringiensis*	3.51c	3.51d	1.66de	1.70d	0.30cd	0.32b	18.08abc	18.83a	755bc	768d
Doxycycline hydrogen chloride + *B, thuringiensis*	3.62b	3.70b	1.72cd	1.79bc	0.32bc	0.33ab	18.94ab	18.46a	790b	782cd
Streptomycin + *B.thuringiensis*	3.60b	3.65bc	1.68de	1.71cd	0.33ab	0.33ab	19.48a	18.85a	799	787cd
Erythromycin + *B.thuringiensis*	3.45c	3.45d	1.60e	1.67d	0.29d	0.29c	18.24abc	17.92a	730d	727e
Lincomycin alone	3.64b	3.65bc	1.80bc	1.84ab	0.33ab	0.33ab	18.35abc	18.70a	806b	801bc
Doxycycline hydrogen chloride alone	3.90	3.86a	1.87ab	1.89a	0.35a	0.35	18.78ab	18.51a	835a	828a
Streptomycin alone	3.94a	3.92a	1.90a	1.85ab	0.33ab	0.35a	17.57bc	18.46a	829a	826ab
Erythromycin alone	3.60b	3.61c	1.81b	1.80b	0.32bc	0.31bc	17.00c	17.88a	770c	767d
Treated control	2.50e	2.50f	1.40f	1.40e	0.22e	0.22d	15.69d	15.69b	692e	685f
Untreated control	3.10d	3.10e	1.68de	1.68d	0.29d	0.29c	17.51c	17.51a	736d	741e

Means followed by a common letter(s) are not significantly different by DMRT (P=0.05)

from 17-25 mm for different antibiotics. Concentrations of 500 and 1000 ppm of the antibiotics, tested for their inhibitory effect by streak plate method showed no growth of *B. thuringiensis.*

In vivo effect of antibiotics on flacherie

Antibiotic solutions prepared under sterilized condition were utilized for the study. Third instar larvae of PM x NB4D2 were reared under hygienic condition and used for the experiment. The treatments consisted of 500 and 1000 ppm concentrations of antibiotics, doxycycline hydrogen chloride, lincomycin, steptomycin sulphate(standard), erythromycin (standard) alone and in combinations with *B. thuringiensis* along with an untreated control (Distilled water) and treated control (*B. thuringiensis* alone). The treatments were replicated three times. The leaves of Kanva-2 variety were dipped in antibiotic solution and fed to the worms. *B. thuringiensis* suspension @ 107 spores/ml were fed once during the second feeding. The antibiotics were administered thrice; immediately after second moult (first feed on first day), first feed on second day and immediately after third moult. Observations for mortality were recorded at 48 h after treatment. The economic parameters *viz*., larval weight, cocoon weight, shell weight, shell ratio and silk filament length were recorded for various treatments.

In vivo effect of antibiotics on growth of B. thuringiensis

Among the antibiotics evaluated, doxycycline hydrogen chloride recorded the lowest mortality of 18.67 and 16.00 per cent for 500 and 1000 ppm concentration, respectively which were found to be on par with streptomycin. (21.00, 18.67 per cent). These treatments were followed by lincomycin. All the treatments were found to record lesser mortality compared to control which recorded 72.00 percent mortality (Table 1.).

The present finding on lesser disease incidence due to administration of antibiotics goes in line with reports of Baig *et al*. (1990) where a lesser disease incidence and an increased ability to survive were noticed. The effectiveness of antibiotics *viz*., streptomycin sulphate was proved earlier by Baig *et al.* (1990) and Samson and Baig (1976).Banuprakash *et al*. (1999) reported the efficacy of erythromycin against *B. thuringiensis.* Norris (1971) quoted the works of Arescaldino saying that the antibiotics do not aid in sporangial rupture leading to release of spores and crystals.

Effect of antibiotics on rearing performance

The antibiotics *viz*., doxycycline hydrogen chloride and streptomycin were on par with each other for all the economic characters (Table 2.) At 1000 ppm, the antibiotics alone recorded higher larval weight of 3.70 g, 3.5lg and cocoon weight of 1.79 g, 1.70g. respectively for doxycycline hydrogen chloride and lincomycin compared to antibiotics in combination with *B. thuringiensis.* The antibiotics alone and antibiotics combined with *B. thuringiensis* had similar effect on shell weight and shell ratio. All the treatments recorded higher economic characters compared to treated control. The administration of antibiotics resulted in increased larval and cocoon characters. Earlier studies also indicated the positive impact of antibiotics on growth, cocoon characters and silk filament length.(Savithri *et al.,* 1999). Walton (1977) attributed the beneficial action of antibiotics to their activity in conditioning the composition of intestinal flora, role as possible growth factors, biological efficiency in increased turning over of feed into body weight and potential disease control activity.

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Madras Agric. J., 95 (1-6): 222-225 January-June 2008

Research Notes

Effect of biopesticides as seed dressers on germination and growth of bhendi

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Bhendi is ravaged by many insect pests right from germination of seeds to harvest of fruits. In the early stage, sucking pests like aphid, *Aphis gossypii* Glover, the leaf hopper, *Amrasca biguttula biguttula* Ishida and the whitefly, *Bemisia tabaci* Gennadius desap the leaves. Farmers rely solely on the chemical insecticides for the management of pests of bhendi because of easy adaptability, immediate and spectacular knockdown effects (Pawar *et al.,* 1988). Among the various options for applications, seed treatment is one of the best methods, as insecticidal seed treatment not only ensures the presence of insecticide residues throughout seedling stage when the plant is most vulnerable to sucking pests like aphids, leafhoppers and whiteflies, but it also relatively inexpensive and easy to adopt when compared