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Horizontal Transmission of *Nosema Bombycis* N. infection on Rearing Parameters of Silkworm, *Bombyx mori* L.

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INTRODUCTION

- The silkworm, *B.mori* has been domesticated since time beyond memory. This continuous domesticated made it susceptible to the attack of a number of pathogens.
- Pebrine is a deadly disease of silkworm caused by *Nosema bombycis* Naegeli (Protozoa:Microsporidia) it is a unique pathogen transmitted through egg (transovarial transmission), by the ingestion of the contaminated leaf and by contaminated egg surface (transovum transmission).

- Normally microsporidiosis occurrence in India is of low intensity during summer and high in winter season in tropics due to increase in the lepidopteron insects during winter and rainy seasons.

- The silkworm larvae infected during early stages of 1st and 2nd instar die upto 5th instar, but if infection occurs during 4th and 5th instar, larvae manages to survive and form cocoons but the silk from the cocoon of infected larvae is usually much inferior (Bhat *et al*.,2009).

MATERIAL AND METHODS

- The above study was carried out at the Department of Sericulture, University of Agricultural Sciences, Gandhi Krishi Vignana Kendra, Bangalore during the year 2009-11.

- The horizontal transmission of *N. bombycis* in both the silkworm breeds (PM and CSR2) was studied on third, fourth and fifth instar larvae.

- They were orally administered with 10^{-3} spore dilution (@0.1 ml of spore suspension) was smeared through mulberry leaves, leaf cut to the size of 12×10 cm and the smeared leaves were fed to the larvae which had come out of the second moult.

- After that, total number of days per instar was recorded after inoculation. Further, ERR (%)was worked out by using the formula.

- ERR= $\frac{\text{Total Number of cocoons}}{\text{Number of worms brushed}}$ X 100

RESULTS AND DISCUSSION

Fifth instar larval duration (days)

- Per oral infection of *Nosema bombycis* to PM and CSR2 exerted significant difference in fifth instar larval duration.
- The data on third, fourth and fifth instar inoculated batches recorded 12.00 to 15.33 days of fifth instar larval duration for fifth and third instar inoculated batches of PM compared to 10.33 and 12.00 days of CSR2.
- Even in fifth instar larval duration the pathogen exhibited its chronic nature and affect on all the three larval duration experimented.
- Further, PM exhibited longer larval duration form 12.00 to 12.67 days of fifth instar larval duration compared to CSR2 (9.33 to 10.25 days). The interaction effect between the breeds and instars was also found significant (Table 1).

Table 1: Effect of *Nosema bombycis* infection on fifth instar larval duration of PM and CSR2 (third, fourth and fifth instar inoculation).

	Pure Mysore			CSR2		
Inoculation	Healthy	Infected	Mean	Healthy	Infected	Mean
Third instar	9.67	14.33	12.00	8.50	12.00	10.25
Fourth instar	9.67	15.67	12.67	8.33	12.00	10.17
Fifth instar	9.33	12.00	12.67	8.33	10.33	9.33
Mean	9.56	14.00		8.39	11.44	
	A	B	C	AB	AC	BC
F test	*	*	*	*	*	*
S. Em.±	0.296	0.296	0.362	0.419	0.513	0.513
CD @5%	0.864	0.864	1.058	1.221	1.496	1.496

Fig 1: Influence of botanical extract treatment to *Nosema bombycis* Naegeli on fifth instar larval duration of PM (days).

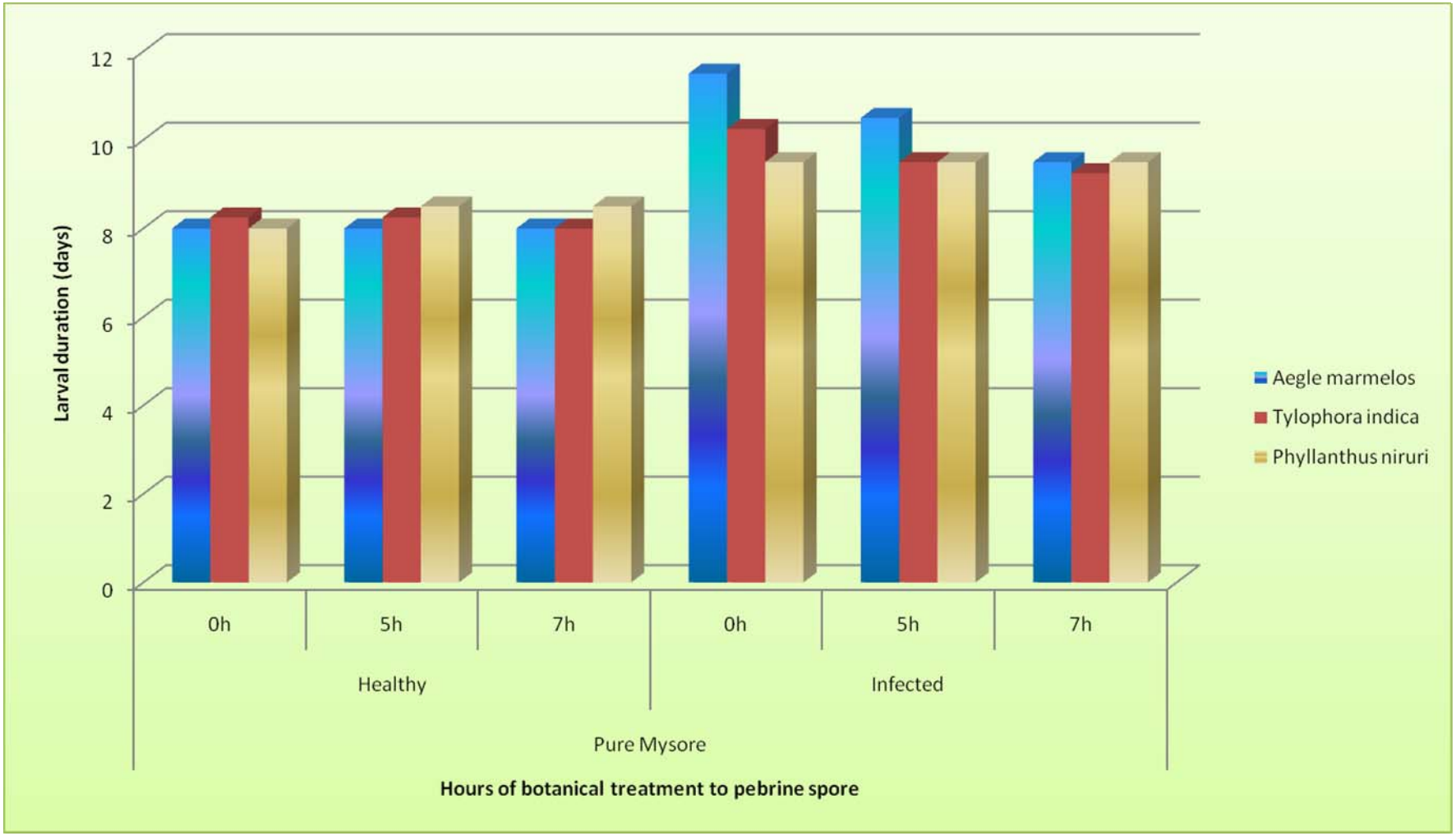
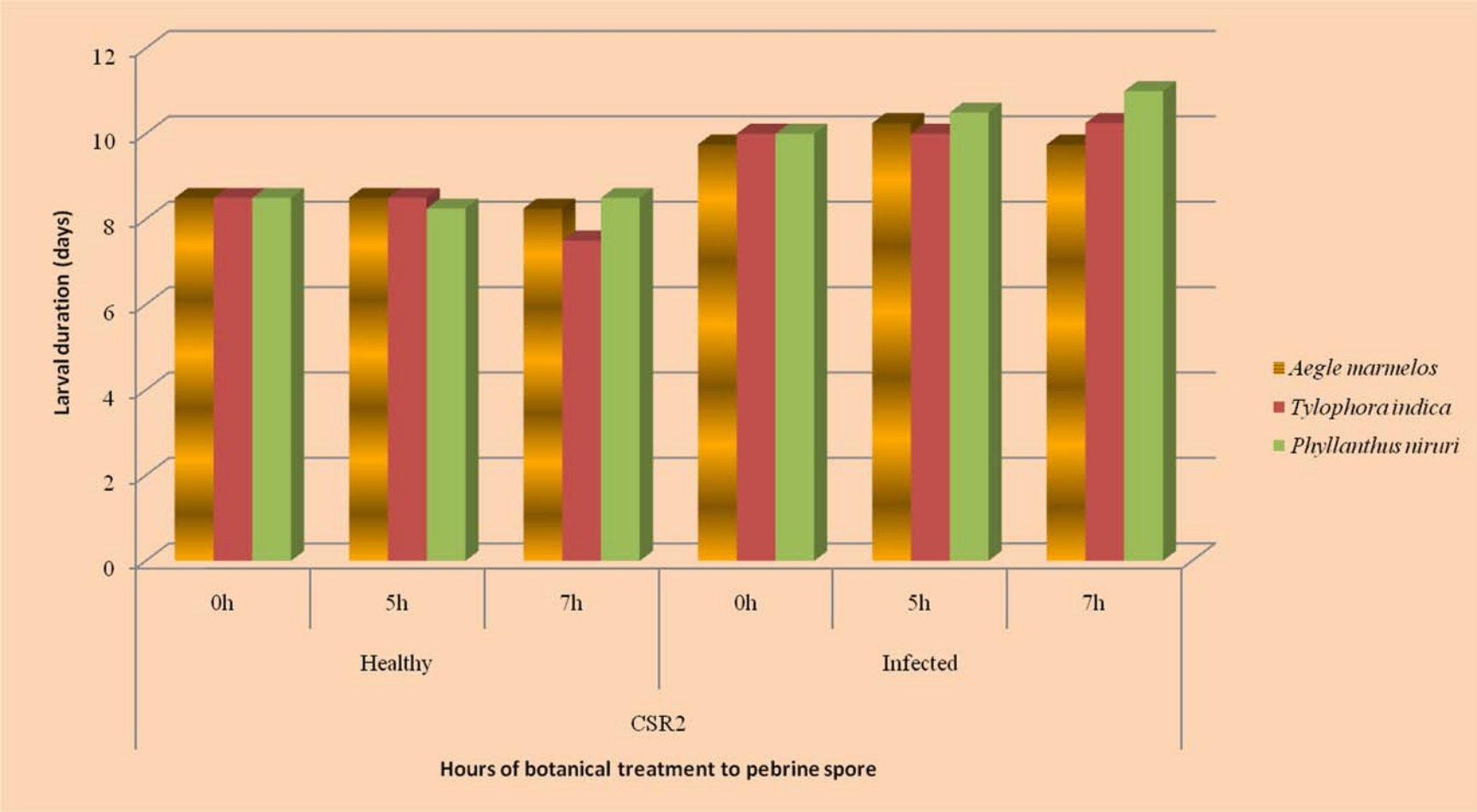


Fig 2: Influence of botanical extract treatment to *Nosema bombycis* Naegeli on fifth instar larval duration of CSR2 (days)



- These results are lined with the findings of Baig *et al*(1988b), according to them a popular BV hybrid NB18 ×NB7 administered with 0.2 ml of spore suspension of 9×10^{-6} spore per ml after third moult experienced significant variation due to pebrine compare to control batch. As per their opinion the infected larvae recorded 676 h of total larval duration compare to healthy 662 h. As in the present study the PM breed has recorded more larval duration than CSR2.

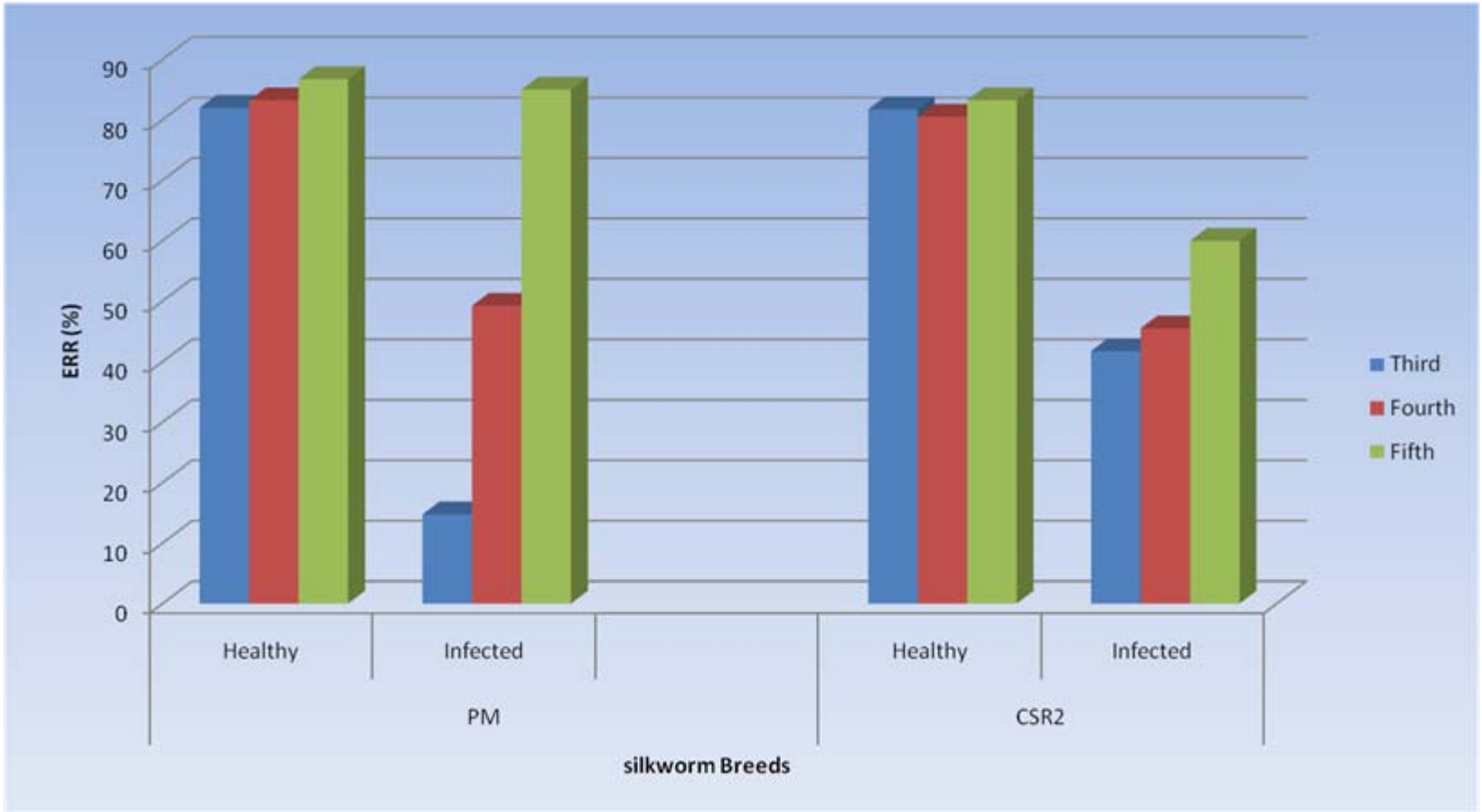
- Further, Patil and Geetha bai (1989) also inferred that, the PM breed grow normally even there is infection. It was well known that, the infected midgut cells are released into the lumen by the elimination of the gut cells and recover from the infection by the regenerative activity of the midgut cells.

- The data on ERR of both PM and CSR2 affected due to *Nosema bombycis* infection. Maximum of 85.00 and 60.00 per cent ERR was recorded in fifth instar inoculated batches followed by fourth (49.25 & 45.50 %) and third instar (14.75 & 41.75 %).
- It is very vivid from the experimental results that, earlier infection due to pebrine caused lower ERR percentage as reflected in the experimental data.
- Among breeds, PM found to be more sensitive for pebrine infection and experienced 14.75 per cent ERR compare to 41.75 per cent ERR in CSR2.
- The interaction effect between the breed and instar was also found significant (Table 2).

Table 2: Effect of horizontal transmission of *Nosema bombycis* infection on effective rate of rearing (%) of PM and CSR2.

Instar	PM		Mean	CSR2		Mean
	Healthy	Infected		Healthy	Infected	
Third	82.00	**14.75**	48.37	81.75	**41.75**	61.75
Fourth	83.25	49.25	66.25	80.50	45.50	63.00
Fifth	86.75	**85.00**	85.87	83.25	**60.00**	71.62
Mean	84.00	49.66		81.83	49.08	
	A	B	C	AB	AC	BC
F test	NS	*	*	NS	*	*
S.Em±	0.96	0.96	1.220	1.409	1.725	1.725
CD @ 5%	2.86	2.856	3.498	4.040	4.947	4.947

Fig 3: Effect of horizontal transmission of *Nosema bombycis* Infection on effective rate of rearing (%) of PM and CSR2.



- These results are in line with findings of Baig *et al* (1988a) who observed that, the hybrid NB18 ×NB7 with pebrine infection recorded decreased ERR of 77.44 per cent to un inoculated compare to distilled water treatment 79.83 per cent.


THANK YOU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