

STUDIES ON THE CONSTITUENTS OF SHELLS AND PEDUNCLES OF DIFFERENT ECO-RACES OF *ANTHERAEA MYLITTA* D.

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Introduction

India has a number of species of *Antheraea* of which *Antheraea mylitta* D. is by far the most important commercial producer of silk. It exists in the form of nearly nineteen eco-races distributed over different states (Jolly *et al.*, 1975). These races are uni, bi and tri-voltine and differ from one another in qualitative and quantitative aspects. Davalikar (1962) has studied the amino acid composition of four indigenous silks namely mulberry, tussar, nuga and eri by ion exchange chromatography. However, no work has been done on the shell and peduncle constituents of different eco-races of *Antheraea mylitta* D. It was, therefore, thought worthwhile to make a quantitative estimation of the constituents of different eco-races of *Antheraea mylitta* D.

Materials and Methods

Out of nineteen eco-races of *Antheraea mylitta* the shells and peduncles of the following nine were analysed for the constituents like moisture, boil off loss, total nitrogen and total minerals: (i) Raily, (ii) Daba TV, (iii) Bogai, (iv) Moonga, (v) Modia, (vi) Laria, (vii) Mandla, (viii) Bhandara and (ix) Jadai.

Moisture was determined by drying the shells and peduncles to constant weight at 100°C. Boil off loss was estimated by

degumming the shells and peduncles with 1% sodium carbonate solution. Total nitrogen was determined by the Micro Kjeldahl method and total minerals according to standard AOAC method (1950).

Results and Discussion

The results of ANOVA have been presented in Table 1 and the mean values of different constituents in Table 2.

The results of analyses of variance of data in Table 1 reveal that nitrogen content varies from 19.34% to 16.78% in shells and from 17.82% to 16.06% in peduncles. Shells of Moonga have the highest nitrogen content (19.34%) which significantly differ from those of all the other eco-races but Laria (17.38%), Mandla (17.22%), Modia (17.09%), Daba TV (16.94%), Bogai (16.93%) and Jadai (16.78%) do not differ significantly. In case of peduncles, Raily has the highest nitrogen content (17.82%) closely followed by Jadai (17.63%) and Moonga (17.39%). These eco-races do not differ significantly but are significantly different from all other eco-races having nitrogen content values between 16.58 and 16.06%.

Shells and peduncles of Mandla eco-race have the highest values of moisture content (12.80% and 11.43%) and Raily the lowest (5.01% and 4.63%) respectively. Further, data reveals that moisture content of Mandla eco-race significantly differs from

Table 1
Data on the analysis of constituents of shells and peduncles of different eco-races of *Antheraea mylitta* D.

Eco-races	Total nitrogen %		Moisture %		Total minerals %		Boil off loss	
	Shell	Peduncle	Shell	Peduncle	Shell	Peduncle	Shell	Peduncle
Raily	18.44 b	17.82 a	5.01 e	4.63 d	6.00 a	0.823 d	20.32 ab	36.01 a
Daba TV	16.94 c	16.58 b	5.40 e	6.14 cd	3.25 e	1.119 d	10.38 d	29.66 bcd
Bogai	16.93 c	16.44 b	6.66 d	4.90 cd	3.44 de	2.157 b	17.63 bc	33.72 abc
Moonga	19.34 a	17.39 a	12.13 a	8.84 b	3.58 cde	0.970 d	18.26 abc	34.91 abc
Modia	17.09 c	16.18 b	11.62 b	9.62 b	4.87 b	0.970 d	15.45 c	35.58 ab
Laria	17.38 c	16.06 b	5.76 de	5.19 cd	4.45 bc	1.308 cd	17.07 c	32.13 abc
Bhandara	18.08 b	16.42 b	9.00 c	6.51 c	4.23 bcd	3.850 a	21.15 a	32.70 abc
Mandla	17.22 c	16.25 b	12.80 a	11.43 a	2.26 f	1.022 d	10.39 d	23.54 d
Jadai	16.78 c	17.63 a	5.41 e	5.05 cd	4.15 bcd	2.630 b	16.12 c	28.55 cd
S. E. (Mean) ±	0.220	0.258	0.365	0.569	0.295	0.172	0.978	2.065
C.D. 5%	0.65	0.77	1.09	1.70	0.88	0.517	2.93	6.19

N.B. :— Means with same alphabets do not differ significantly at P=0.05.

all the other eco-races. Moisture contents of both shells and peduncles of Bhandara (9.00% and 6.51%) and Laria (5.76% and 5.19%) respectively occupy the intermediate positions.

Average values of total minerals contents of shells of different eco-races vary from 6.00% to 2.26%. Raily eco-race represents the highest value for total minerals content (6.00%) and it is significantly different from other eco-races. Modia (4.87%), Laria (4.45%), Bhandara (4.23%) and Jadai (4.15%) have the intermediate values but do not differ significantly. Similarly total mineral contents of peduncles range from 3.850% to 0.823%. Bhandara eco-race is found to have the highest value of total minerals per cent which is significantly different from those of all the other eco-races. Jadai and Bogai having the intermediate values 2.630% and 2.157% respectively in peduncles do not differ significantly but are significantly greater than the values of total minerals percentage of other eco-races which vary from 1.308% to 0.823%.

The results in Table 1 also reveal the highest value of boil off loss percentage (21.15%) in shells of Bhandara and the lowest (1.038%) in Daba TV. Boil off loss values of Bhandara and Raily are significantly higher than those of other eco-races. In peduncles boil off loss values range from 36.01% to 23.54%. Raily eco-race

has the highest value (36.01%) closely followed by Modia (35.58%), Moonga (34.91%), Bogai (33.77%), Bhandara (32.70%) and Laria (32.17%) which do not differ significantly. The peduncles of Mandla eco-race have the lowest boil off loss (23.54%) which differs significantly from other eco-races except Laria (28.55%).

Considering the inter-racial variations, data of Table 2 reveals that mean values for all the constituents except boil off loss percentage are greater for shells as compared with peduncles. It can be assumed that total minerals content and boil off percentage are responsible for the toughness of cocoon shells thereby suggesting the validity of variation in cooking media and period for different eco-races of *Antheraea mylitta* D.

Table 2
Inter-racial mean values of different chemical constituents

Constituents	Mean values	
	Shell	Peduncles
Moisture %	8.20	6.92
Total minerals %	4.03	1.65
Total nitrogen %	17.58	16.78
Boil off loss %	16.31	31.90

SUMMARY

Shells and peduncles of nine eco-races viz., Raily, Daba TV, Bogai, Moonga, Modia, Laria, Bhandara, Mandla and Jadai of *Antheraea mylitta* D. were analysed for the four constituents viz moisture, total nitrogen, total minerals and boil off loss. Results of analyses of variance reveal that the eco-races differ significantly from each other in respect of all the four

constituents of shells and peduncles. Considering inter-racial variations, mean values for all the constituents except boil off loss are higher in cocoon shells. Total nitrogen varies from 19.34% (Moonga) to 16.78% (Jadai) in cocoon shells and from 17.82% (Raily) to 16.06% (Laria) in peduncles while total minerals content ranges between 6.00% (Raily) and 7.27% (Mandla) for shells and between 3.85% (Bhandara) and 0.823% (Raily) for peduncles. Similarly, boil off loss content varies from 21.15% (Bhandara) to 10.38% (Daba TV) in shells and from 36.01% (Raily) to 23.54% (Mandla) in peduncles. Cocoon shells and peduncles of Mandla eco-race have the highest moisture content (12.80% and 11.43%) and that of Raily eco-race the lowest (5.01% and 4.63%) respectively.

गन्धेरी माइनिट्टा डे० (रेशम कीट) की विभिन्न परिस्थिति जातियों के शल्कों और वृन्तों के संयोगांगों का अध्ययन

आर०के० गोयल, ए०के० सिन्हा, बी०एन० ब्रह्मचारी व के० मेनगुप्त

सारांश

गन्धेरी माइनिट्टा डे० (रेशम कीट) की नौ परिस्थिति-जातियों अर्थात् रेली, डाबा टीवी, बोवाई, मुंगा, लोडिया, बारिया, भन्डारा, मंडला और जडई का विश्लेषण उनके चार संयोगांगों अर्थात् नमी, कुल नाइट्रोजन, कुल खनिज और फूलकर फटने पर हानि की दृष्टि से किया गया। विवर विश्लेषण के परिणामों से पता चला कि शल्कों और वृन्तों के इन चारों संयोगांगों में एक दूसरे से सार्थक अन्तर पाया जाता है। रेशम के कीटों के शल्कों में फूलकर फटने से हुई हानि को छोड़कर अन्य संयोगांगों की जातियों की एक दूसरे से विवर माध्य अर्थात् बो लक्षते हुए कौशिय कीट शल्क में उनका कुल नाइट्रोजन 19.34% (मुंगा) से लगाकर 16.78% (जडई) तक तथा वृन्तों में 17.82% (रेली) से लगाकर 16.06% (लड़िया) तक है तथा कुल खनिज शल्कों में 6.00% (रेली) से लगाकर 7.27% (मडला) तक तथा वृन्तों में 3.85% (भन्डारा) और 0.823% (रेली) के बीच में है। इसी प्रकार शल्कों में फूलकर फटने से हुई हानि 21.15% (भन्डारा) से लगाकर 10.38% (डाबा टीवी) तक तथा वृन्तों में 36.01% (रेली) से लगाकर 23.54% (मडला) तक पाई जाती है। मडला परिस्थिति-जाति के कौशिय कीट शल्कों और वृन्तों में नमी अधिकतम (12.80% और 11.43%) तथा रेली जाति में निम्नतम (5.01% और 4.63%) पाई जाती है।

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