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Research paper

Health Risk of Bringing up Silk Worms and Environment Effect Evaluation of Binging up Households in Kashmir, India

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A R T I C I E I N F O

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A B S T R A C T

This investigation aim is to study the sericulture significance in Kashmir, the environment influence of sericulture bringing up units, and evaluate the health hazard characteristics of the employees performing in this industriousness. The investigation has been performed in various bringing up units of Kashmir valley placed in India. A collected questionnaire has been distributed between the breeder and management issues for assessing the health danger characteristics of the employees. Temperature, moisture, and light severity have been estimated by using a thermos hygrometer and digital lux meter, orderly. This study demonstrates that most of the breeder have suffered from health issues such as irritation of the eye, damage, backache, allergies, respiratory issues, and headache. Specific measurements have been proposed that might enhance the economic situation of the breeder that might finally decrease the health hazard agents between them. Thus, it is suggested that individual protective tools and instruments for bringing up must be presented to the breeder for reducing the health danger agents.

Introduction

Sericulture is the main cottage industriousness in numerous countries, and in India, it has a crucial part in the national economy (Veer et al. 1996). It is a labor-sever export-oriented, industry of agro-base, producing highly work and earnings for each unit region (Rani 2007, Unni et al. 2009). The yearly product of silk in the world is assessed at 45,000 T (www.krishiworld.com) and India rates second in silk product between the mulberry silk growing countries (Veer et al. 1996). The commercial silk bulk is gained from the mulberry silkworm (Bombyx mori L.). Sericulture in India is experienced especially in tropic environment areas like Karnataka, Tamil Nadu, Andhra Pradesh, West Bengal, and for a confined time in the temperate environment of Jammu & Kashmir (Singh & Kumar 2010). The healthy weather of Jammu & Kashmir State is so appropriate to produce silk by bringing up bivoltine silkworms. The industry of silk in Kashmir provides work of 0.022 lakh breeders and delivers of 8800 kg of raw silk yearly. It exports productions to a tune of 1.22 lakh INR (Digest of Statistics 2008).

Silkworm breeders demand special environmental situations for producing qualitatively and quantitatively better cocoons. Sufficiently areas should be existence for carrying out leaf protection, chawki breeding, support, cleaning, and sterilization. nevertheless, the inappropriate weather situation in Kashmir contributes for the poorly execution of the bivoltine species and the significant perspective is that numerous qualitative characteristics like livability and cocoon features

reduce sharply while the temperature and moisture arent nicely in the standards (Shibukawa 1965). Appropriate lighting requirements in breeding places are so essential to the general quality of cocoon product (Meenal et al. 1994).

In Kashmir, silkworm breeding is accomplished as an aid for farming just in the summer season. The breeding is still a fairly simple type and contains classic Sikiris, regional mount matters, and is accomplished under the household situations. Periodically, breeding cooking is performed in an identical room because of space lack by not considering the reasonable ventilation. The breeders are employed in some kinds of assignments and are revealed to numerous physical, chemical, and biological features, causing them weak in different health issues, which contain damage, musculoskeletal conditions, allergies, irritation of the eye, and respiratory infections. The work nature, lower earnings, poorly operating environment, and access lack for professional health services generate concern in the breeder's minds. These characteristics influence the health of breeders, and their proficiency and product. The current investigation has been performed for identifying the environmental and health problems related to silk breeding, evaluating the potential environmental issues according to breeding, and suggesting remedying actions for reducing the negative effect of the breeding actions on the environment and general health.

Methodologies

This investigation has been performed in various breeding places of Kashmir (India). Totally 214 and 192 breeder experienced in the current study in summer 2008 and 2009, orderly. An equivalent number of management of the identical age level relating to alike socioeconomic position by no disposal for silkworm breeding ,and whose have been generally healthy have been chosen from the identical locality. Details on professional and medical record, employment report, and socioeconomic position have been gained by questionnaire. Matters including earlier record of illnesses have been banned from the investigation. The breeder choice of the breeders and management issues has been according to accidental sampling method.

The pressure of the blood has been measured utilizing a mercury sphygmomanometer. Height has been estimated in whole members by the aid of non-stretch measure tape. The member's weight has been estimated with locating a weighing device on a hard-floor level. Gradation has been accomplished at the starting and ending of every examine day. Temperature, moisture and light severity in breeding place have been estimated by aid of the thermos-hygrometer and digital lux meter orderly.

Results

Demographics

From all employees studied, 85 percent have been men and 15 percent have been women. They have been in the age level of 35 to 55. Most of the breeders have been unable to read or write and male breeders have been tobacco users. The occupational year's average as a breeder have been about 15 to 20 years. Table 1 demonstrates the demographic details of both the breeders and the management issues.

Table 1. Physical features of the breeders in various breeding units.

Factors	2008		2009	
	Expose	Management	Expose	Management
Year	41.36	45.3	42.3	47.2
Weight	62.30	65.30	58.23	62.3
Height	5’4"	5’.4	5’.2"	5’.3"
Systolic pressure	127	130	130	135
Diastolic pressure	67	75	73	78

Earnings and economical agents

The information are on earnings and different agents are presented in Table 2. Reason for merging breeding employment are basically linked to economical agents, this appears to be the most typical and appropriate profession for taking up from the economical view point. Other professions are either not existing or aren't enough earning producing. Therefore, despite of the health issues such as respiratory diseases, headache, common cold, burns, backache, individuals select for silk breeding. Employees gain about 2100 to 3500 INR each month and usually work about 6 to 7 hours per day. The lower earnings levels of the employees and health issues, which they face severity their already precarious living situations.

Table 2. Earnings and socioeconomic situation of the breeders.

Location	Population	Education		Number of breeding places	Sericulture monthly average income		Average room in location	rooms inhabited by breeding
		Male	Female		2008	2009		
Panner Jagir	791	370	503	25	2245	2193	4	2
Mondoora	843	327	563	18	2575	2396	3	2
Bathnoor	965	533	863	40	3287	2905	4	2
Brinal Lammar	6745	1232	558	31	3501	3156	4	2
Y. K. Pora	3767	1140	668	33	3211	2986	3	2
Chowgam	2735	750	453	27	3063	2693	3	2

Working in silkworm breeding units isn't steady over the year, while last just for 2 to 3 months each year in Kashmir because of its weather situations. Elder workers are performing silk breeding. Both males and females of the individual homes. Kids are affected rarely it is typical for finding that parents are presenting them to sericulture procedures very early. Significant number of breeders has pursue this line after their parents. Females have many duties that improve their success for suffering from different health issues. Irritation biomass fuel in these units causes their health issues. Additionally they are faced to many hours of wood fuel smoke in the houses while, they cook food. Both breeding like other family movements are performed in the identical home at the same time and in an average 2 or 3 rooms have been employed with silkworm breeding.

Silkworm breeding problems

Leaves' poor quality

Occasionally silkworms get sick in the silkworm breeding. Breeders noted that this is due to the lower mulberry leaf quality. Bivoltine silkworms are exposed to infections, are so susceptible, and need appropriate temperatures and moisture, good breeding strategy, and well mulberry leaf quality for surviving. In the growth last step, silkworms require a good quantity of mulberry leaves, which the breeders have to consumed additional time in gathering leaves that they generally couldn't support.

Heat systems

Occasionally, valley weather situations change suddenly that the necessary temperature for the growth of silkworms isn't sustained owe to the absence of a heat system. The result is a significant failure to the breeder because of the lower cocoon product.

Plantations

Mulberry farms are mostly existing on side of the roads by some farmhouses placed by breeders and bush farms are located just in sericulture centers. Mulberry plant root cleansing is accomplished by flowing the plant three or 4 times in a dyathin solution, Then the pesticide wastewater is pitched away. Heptachlor powder is utilized as a protector for termites and used for trees. Kerosene oil is employed for the stem borer. Fertilizers include urea, phosphate, potash, and cow dung, which are utilized in fertile areas for planting. In the pesticides and fertilizer application, breeders don't utilize any type of individual protecting tools that reveals them to health hazard agents.

Breeding shed

The breeders have been additionally worried about breeding sheds than health issues. The breeding populates whole rooms and breeders are encountering an acute deficiency of rooms as breeding advances. It has been regarded that on average 2 or 3 rooms are populated by breeding that places these breeders under mental pressure. The undesirable odor come from these places involves their children poorly. However, the worrying department has been confirmed numerous times, which breeders would be provided appropriate sheds for breeding. It has been seen that silk iris haven't been delivered to breeders to burn charcoal for keeping the room steady temperature. They have been utilizing tin canes and for charcoal, they have been burning biomass to preserve the place temperature.

For providing optimal environmental situations such as temperature and moisture in breeding time, a different breeding shed must be created of the size of about $20' \times 40' \times 15' \, (L \times B \times H)$ *or* $30' \times 18'13' \, (L \times B \times H)$. Free cross ventilation should be guaranteed with supplying an acceptable windows number.

Environmental requirements

For silkworm growth in a suitable situation, the appropriate humidity, temperature, and light severity are so essential. The average temperature in the breeding units has been 23.6±0.3°C in summer of 2008 and 23.01±0.59°C in the summer of 2009, the highest of 29.8 ±1.2°C in the summer of 2008 and 30.265±0.53°C in the summer of 2009 (Table 3). The seen highest and lowest average moisture

have been under the standards (65 to 70percent). The average humidity in the units has been 64.3±4.3 percent and 58.96±1.65 percent in the summer of 2008 and 2009 orderly (Table 3). The light severity average has been among 95.2±1.0 in summer of 2008 and 121±7.8 in the summer of 2009 in the breeding units (Table 3).

Table 3. Temperature, humidity (percent), and light (lx) in various breeding rooms

Factors	2009 Summer	2008 Summer
Average temperature at breeding rooms	23.6	23.01
Maximum temperature at breeding rooms	29.8	30.26
Minimum temperature at breeding rooms	17.5	18.8
Day humidity at breeding rooms	64.3	58.9
Maximum humidity at breeding rooms	73.2	74.9
Minimum humidity breeding rooms	31.6	33.8
Light intensity (lx) at breeding rooms	121	95.2

Health hazard agents

Employees concerned in breeding noted that they sorrow from respiratory issues. Such as musculoskeletal diseases, irritation of the eye, allergies, and damage. Most of them are concerned at breeding have been sorrowing from headaches 42.99 percent, common cold 31.77 percent, asthma 12.14 percent, chest pain 27.1 percent, vertigo 35.51 percent, irritation of the eye 14.95 percent, damages 37.38 percent, burning 11.21 percent, wheezing 2.8 percent and allergy 4.5 percent. Nevertheless, in the group management, headache, common cold, asthma, chest ache, vertigo, irritation of the eye, damage, burns, wheezing and allergy have been seen in 14.01, 10.28, 1.84, 8.41, 6.54, 1.8, 0, 0, 0, 0, and percent orderly. In 2008 as seen in Fig. 1.

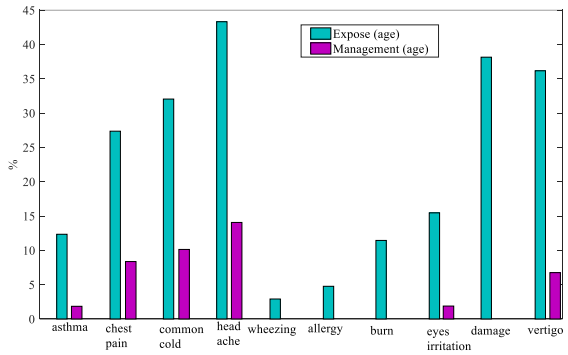

Fig. 1. Illnesses percent of breeders and management population in 2008.

The majority of headache, cold, asthma, chest ache, vertigo, irritation of the eye, damage, burns, wheezing, and allergy have been seen in 46.35, 32.81,13.54, 29.16, 38.02, 16.66, 40.10, 13.54, 3.12 and 6.25 percent breeders, orderly. The majority of headache, common cold, asthma, chest ache, vertigo, irritation of the eye, damages, burns, wheezing and allergy have been seen in 16.14, 10.93, 1.56, 6.25, 8.33, 2.08, 0, 0,0.52 and 0percent in controlling issues, orderly (Fig. 2).

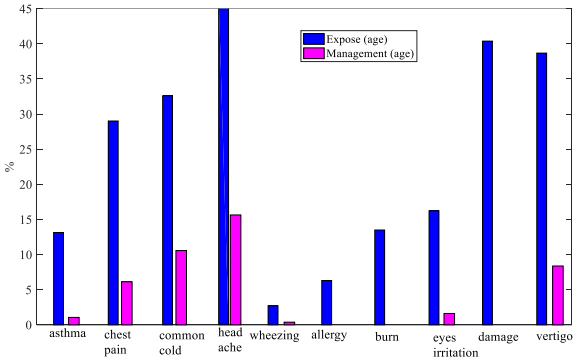

Fig. 2. Illnesses percent of breeders and management population in 2008.

Environmental influence

In this study, the wastewater and solid waste removal have an effect on the environment. There are numerous chemicals, pesticides, and fertilizers utilized in various locations of sericulture movements, such as plantation, breeding, grain age,

and weave. These chemicals have harmful impacts on the human ecosystem if not managed appropriately. Fertilizers and pesticides utilized in mulberry farms might have an impact on the silkworm according to its remaining toxicity that influences the quality and quantity of cocoon products and generates negative effects on the surroundings.

Workers that work in breeding, sorrow from numerous illnesses that have an influence on their economic situation because they work lesser since of poor health. Firewood are utilized to keep the temperature of the place steady. The smoke might release poisonous carbon monoxide that stinks into the air and the utilization of firewood adds to jungle demolition. In most breeding places, the removal of chemicals and solid garbage is a neglected topic. Breeders aren't informed about the dangerous impacts of these chemicals on their health and surroundings.

Land-soil characteristics

Solid garbage are left outside that might induce modifications in soil features. Various kinds of chemicals from wastewater and solid garbage pollution dumped on soil might ruin soil microbes and decrease the natural soil fertility. The chemicals might change soil material and the soil's permeability.

Water contamination

Surface water contamination might happen according to the garbage drainage to water bodies by rainwater. Chemical remains from garbage spread groundwater via infiltration. Contaminants might persist in groundwater over a long duration and could travel a long distance without any change.

Air pollution

Air releases from breeding include oxides of nitrogen, sulfur, carbon, volatile organic solvents, dust, and soot. These releases might be poisonous in the surroundings and generate professional health problems for the employees. These contaminants might also generate environmental and health dangers in the sites.

Discussion

Sericulture being a labor-severe rural-based industriousness presents a qualitative and quantitative difference in deprivation alleviation. It presents the work chain of inexperienced farm laborers for silk artisans for whole areas, particularly females, while at the same time its production generates instrumental health issues in a considerable ratio of employees. The silk breeding technology that is mostly utilized, is fairly simple, causing it potential for inadequately literate individuals for working by them. Nevertheless, the health issues connected with breeding are going to get to the earnings, this causes it probable that most of the breeding employees would stay in breeding for the life and the kids. Breeding as social mobility holds its own limits and largely could be regarded as an adequate standard of enhancing the lives of employees.

In severe deprivation, the Anantnag and Pulwama people bring up silk breeding as a way of earning living. Nevertheless, they will encounter the issues of work in a place that has many health dangers. By highly ratio of employers being losses of different illnesses. This appears to be a heightened danger, which reduces the life quality in breeders. The contamination generated by burning biomass fuel, for keeping the place temperature preserved has some imports on health. Different kinds of disinfectants utilize such as vijatha, formalin, lime, and purifier solutions make them burn eyes, sneezing, and chest-related issues. Disinfection by formalin and dust by lime by not utilizing personal protecting equipment cause burn eyes and throat. Respiratory issues in breeders might be assigned to aspiration of feces and silkworm scales by the breeders (Myers & Barnard 1998) and lime, formalin, and bleaching powder for disinfecting utilized in the breeding places (Ramanathan 1997).

Breeders have burned biomass in conventional tin cans for Sikiris. In addition, grab different kinds of burns. For chopping leaves, individual's often obtain damages and discover it hard for treating them in the first location. They chew the leaves of mulberry and use it on the damaged parts that stated is very useful as reached to the medicines obtainable in the markets. Breeders have to clear the bed and provide the worms during normal breaks as well as their household employment by not including adequate relaxation that reveals them to backache, tiredness, and headache. The lower blood pressure in breeders might be related to extreme perspiring because of weed, leaves transportation to the breeding sheds, and breeding of worms that are additionally troubled by the unstable breeder's food habit.

Commitment to age-old classic techniques, the slow influence of enhanced technology, quality lack of silkworm grain, deficient breeding area and machines, elementary breeding, spinning and weaving, and poor trade and amount of additional links are some of the main limitations of sericulture in the room. Protecting environmental standards aren't just more beneficial for people and the environment generally, though is price-effective also. If concealed expenses are assessed, like medical costs, product damage according to health consequences, inadequate product results because of contamination inland rate, and adverse effects on bio-diversity of neighboring regions, the expenses of neglecting environmental protecting would be high than assuming proper stages now. Central

Sericulture Research & Training Institute's sericulture program might not now possess general environmental effects, while as Central Sericulture Research & Training Institute plans for significantly advance its outcome in the coming years, the potential for environmental damage would rise. This is a considerable significant time for implementing sound protection measurements, as the schedule is in its early development phases. It would be easy and economical for developing more environmentally agreeable options for any poisonous substances being utilized.

The issues faced by breeders are high change in cocoon expenses, weather disorders, and insufficient property for purchase, insufficient markets skills, and exploitations by intermediaries, transport issues, lack of skilled employees, and health issues such as respiratory problems, eyes burning, backache, and tiredness. Thus, we suggest the following steps for the expansion of the sericulture industriousness and lessening the health issues of the breeders. Programs must be performed at the village class for ensuring more prominent and adequate involvement of females in transferring the technology for upgrading the skill and suggesting simple possibilities, safe technology, and personal protective tools for overcoming the health issues. High fluctuation in cocoon earnings is limit the farmer from derivable high income that arises because of the heavy importance of China silk. Management must bring critical policy determinations for protecting the farmer from these fluctuations in expenses by lessening the China silk import according to the supply and need of Indian silk. For making sericulture environmentally tolerable and economically possible, it might be more reasonable having inter-program cooperation, common exercise, and environmental attention programs by breeders.

Conflict of interest

The authors declare that they have no conflict of interest.

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