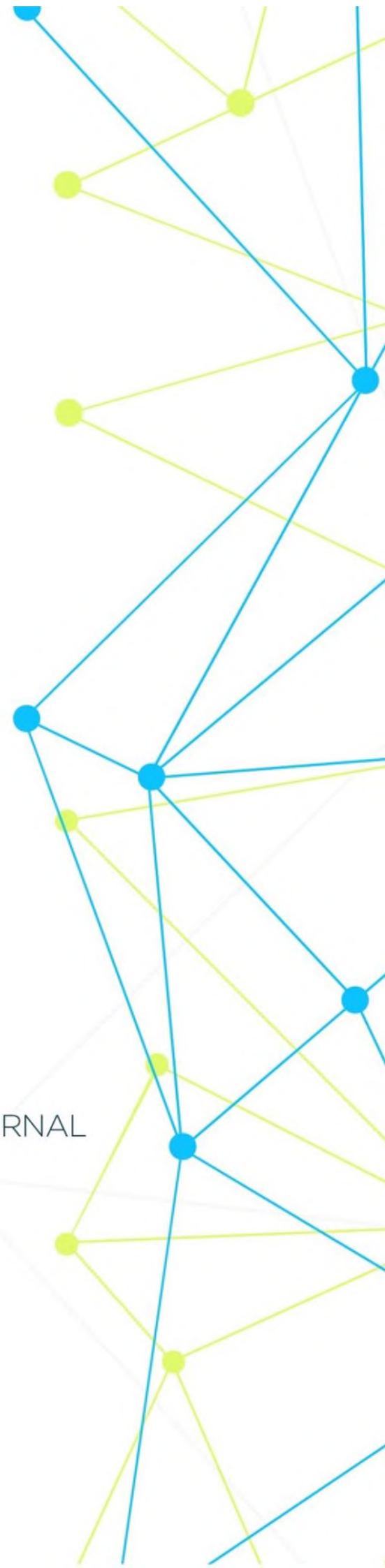


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Influence of working conditions in uzbek silkworm plants on the functional state of the body of women

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Abstract: Workers' working conditions in producing silkworm grapes do not comply with hygienic regulations. Analysis of the dynamics of the indicators of the functional state of their bodies showed that from the beginning to the end of the working day, physiological reactions are indicating pronounced industrial fatigue. The introduction of preventive measures is necessary to reduce the fatigue of the labor process.

Keywords: silkworm production, working conditions, functional state of the body, fatigue, prevention.

The production of natural silk is increasing year by year in Uzbekistan. The government's investment policy of the republic has allowed in recent years to more than 2 times increase the volume of production of domestic productive breeds of mulberry silkworms, than which cocoons are grown. Uzbekistan ranks 4th in the world after China, Vietnam, and India production of live cocoons. Currently, there are 17 silkworm plants and 3 breeding silk stations producing elite and super elite gremas in Uzbekistan. The peculiarity of the technological process of gremas production, increasing from year to year volumes of gremas production, cause the employment of a large contingent of working women in this agricultural branch of the national economy of the republic.

The technological process of gremas production (mulberry silkworm eggs) is divided into two stages.

The first stage is the fattening of caterpillars (April-May), which is carried out on farms.

The second stage is acceptance of cocoons at mulberry silkworm plants, papilionage operations (leaving cocoons, laying them on frames for mating, steaming moths and collecting deposited larvae), processing, washing and hanging larvae (June); storage of larvae in cold storage chambers in winter conditions (November-February).

The main sanitary and hygienic factors during the feeding period of silkworm caterpillars, which lasts up to 30 days, are heating, humid microclimate of worm-houses, abundant microflora, high content of carbon monoxide vapor, hydrogen sulfide and ammonia, dusty air, irregular, intensive work with considerable physical exertion.

The duties of worm breeders include collecting and preparing silkworm leaves, stacking them in the worm houses, and working with mulberry silkworm caterpillars. Women mostly perform all production operations.

Work involving the collection and preparation of mulberry leaves takes up to 50% of worm breeders' daily time, i.e. up to 12 hours. In the breathing zone during this period, they determine dust, the source of which is dusty silkworm branches. Concentration of dust varies from 5,8 to 7,4 mg/m³, average level is 6,7 mg/m³ (MAC-6,0 mg/m³) [2].

During this period, the severity of the labor process is associated with the need to lift and carry mulberry leaves to worm-houses at a distance of more than 5 meters. The physical dynamic load during this labor operation (involving arm, trunk and leg muscles) is more than 40000 kgm.

Worm breeders systematically put mulberry leaves to caterpillars during the day, every day they come into contact with mulberry silkworm caterpillars and products of their life activity for an average of 4 hours.

While in worm-houses, working women are exposed to a warming, humid, convectional microclimate. The air temperature in worm-houses during the fattening period varies from 24 to 36°C and averages 29.8°C, the relative humidity is 26-55% (the average is 38.8%), and the air is low-moving.

It was found that total insemination characterizes the air in the worm-houses with sanitary-positive microorganisms, the level of insemination is within hygienic norms. Sanitary-positive microorganisms were also detected on clothes and exposed body parts of working women. The presence of hydrogen sulfide, ammonia and carbon monoxide vapors was also detected in the air in the worm-houses. The content of ammonia in the air of worm-houses in the breathing zone of fatteners exceeded MPC 1.1 times, the average concentration being 22,2±0,7 mg/m³. The content of hydrogen sulfide (a substance with an acute effect) in the breathing zone of fatteners exceeds the MPC 1.3 times, the average concentration is 13.0±0.56 mg/m³. Carbon monoxide content in the breathing zone of worm breeders did not exceed on average the sanitary norms, it was equal to 14,3±1,4 mg/m³.

Illumination of working surfaces in worm-houses is natural, artificial light is turned on only in the dark time of day. The level of illumination is uneven and varies from 5 to 800 lux, the average level is 111.6±9.8 lux, the coefficient of natural illumination (CEI) ranges from 0.45 to 5.79%, on average CEI is 2.04%.

Working conditions of women engaged in feeding silkworm caterpillars belong to the 3rd class of the 3rd degree of hazard [3,6].

A study of the functional state of women engaged in feeding silkworm caterpillars showed that 57.3% of those examined had elevated blood pressure. More often, elevated blood pressure was in low-salary women.

With increasing length of service associated with feeding silkworm caterpillars in women increases the difference between proper and actual biological age: with the length of service of 1 year biological age is higher than the proper biological age on average of 2.3 years, with up to 10 years of service this figure increases to 5 years, with experience over 15 years biological age is 12.5 years above the proper biological age [Biol.oz]. Besides, with the increased length of service, the indicators characterizing subjective estimation of their psycho-emotional state worsen in working women.

The obtained data indicate the necessity to develop and implement measures to improve the working conditions of worm breeders.

The second stage - reception of live cocoons and carrying out papilionage work is carried out at silkworm plants. Cocoons are received at the silkworm factories within about 20 days. Cocoons are accepted from 6 to 8 a.m., while there is no heat, so as not to damage the pupa inside the cocoon. The agronomist-greener accepts the breeding cocoons and evaluates their quality. Accepted by the plant breeding cocoons that are not sorted by sex are transferred to the workshop, where they cut the shell with a blade, released pupa, sorted by sex pupae. One worker cuts off 3-4 kg of cocoons (1 kg 290-300 cocoons).

After 3-4 days, the chrysalis turns into a butterfly (usually at 6-7 a.m.) and work with them begins (papillonage). The worker by hand on a frame, the bottom of which is lined with lavsan cloth, throws a certain number of butterflies (50 to 100 pieces) females, then adds a larger number of male butterflies there. After one-hour, free male butterflies (not involved in mating) are manually removed from the frame, the frame is left for another 2 hours. Then the frames are placed on racks in workshops with high humidity (more than 80%), which is achieved by watering the floor of the workshop. In 4 hours, the frames are dropped from the butterflies (frame weight 2.5 kg) and the fabric is left on the elite grenade, which is stored until November in conditions of low temperature and high humidity.

A complex of adverse factors characterizes working conditions for women working with cocoons, pupae and butterflies: the dustiness of the working area with fine dust during the emergence of butterflies from cocoons; limitation of general mobility, the monotony of work operations (cutting cocoons to release pupae, division of pupae by floor, work with butterflies), performing not very complex production operations, but which require stress of attention and vision, forced, uncomfortable working posture, static muscle tension when lifting the

During the papilionage period (mating of butterflies) scales are detached from the wings of many butterflies, which fly around in the air. They are irregularly shaped with pointed edges and long spikes. Dust from mating plants consists of 75-80% of organic substances of animal origin (the smallest chitinous scales) and contains a small amount (about 0.01%) of protein substances. The size of 90-95% of the dust particles is up to 10 microns. The concentration of dust in the breathing zone of papilionadiers ranges from 5.3 to 12.5 mg/m³ (MPC - 4 mg/m³).

The organic composition of industrial dust, the presence of a protein of animal origin, shape and size of dust particles have a pronounced allergenic and local irritant effect.

During work with cocoons, pupae and butterflies, the air of the working area is polluted with ammonia, hydrogen sulfide and carbon monoxide - products of life activity of pupae and butterflies. An excess of ammonia in the breathing zone of women was observed during production operations of separating pupae by sex and removing free male butterflies from the frames. The mean concentrations of ammonia were 21.45±0.7 and 21.3±1.26 mg/m³ (1.06-1.07 times excess of MPC), respectively. Content of dihydrosulfide (hydrogen sulfide) in the air of the working area exceeded MPC when free male moths were removed from frames, when moths were steamed and when male moths were removed from frames. Mean concentrations of dihydrosulfide at these sites were 11.3±1.26, 13.1±0.69 and 11.2±0.96 mg/m³, respectively (exceeding MPC by 1.12-1.31 times). The excess of carbon monoxide content was detected in the breathing zone of women during the production operation, "cutting the head of a cocoon". The average concentration of carbon monoxide was 22.3±0.43 mg/m³ (exceeding MPC by 1.11 times).

In the process of gyre production, a certain temperature-humidity regime is maintained, in which silkworm moths are most viable. Meteorological conditions in the silkworm workshops are discomforting: the temperature ranges from 28.8 to 32°C from the beginning to the end of work, humidity is 40-50%. This is achieved by primitive means: darkening the windows from direct sunlight and moistening the rooms' floor.

Most of the production operations in the silkworm plant are carried out under visual control. The lighting of working surfaces is natural. The level of illumination in different production areas is significantly lower than the hygienic regulations [8], fluctuates on average from 25 to 53 lux, the coefficient of natural lighting is 0.3% on average.

All labor processes of silkworm production are characterized by repeated repetition of the same working operations, i.e. refer to monotonous labor. Production operations performed when working with pupae more than 25% of working time are

performed in a forced working posture (squatting, kneeling), when mating and separating butterflies, more than 80% of working time are performed standing, accompanied by the same type of hand movements and associated with the strain of vision.

Working conditions of women working at the silkworm plants are referred to as the 3rd class of the 3rd degree of harmfulness [3,6].

The study of functional condition of an organism of women working at silkworm works has revealed unfavorable changes from the beginning to the end of a working day in a condition of the higher nervous activity and attention function, deterioration of parameters of the neuromuscular system, not sharply expressed changes of the cardiovascular system, and also premature aging of an organism.

Specific working conditions in the silkworm industry affect health: some workers suffer from respiratory diseases.

To eliminate the adverse effects of the working conditions of silkworm production on the body of working women, it is necessary to use the following recommendations:

1. In order to prevent occupational diseases of female workers in silkworm plants, it is necessary to follow the list of medical contraindications when hiring strictly. Persons with severe atrophic rhinitis, laryngitis, tracheitis, chronic bronchitis, bronchial asthma, pulmonary emphysema, pneumosclerosis, bronchiectatic disease, chronic eye diseases (eyelids, conjunctivae, cornea, tear-exhaust), persistent decrease in visual acuity [7] should not be employed at the silkworm plants.

2. An important measure to prevent occupational diseases of silkworms and reduce overall morbidity is to conduct periodic medical examinations. General blood test, chest radiography is mandatory. Workers of the silkworm industry must be examined once a year by a therapist, eye doctor, dermatovenerologist and otolaryngologist.

3. In order to prevent occupational diseases to work on feeding silkworms, should be allowed to persons after a preliminary medical examination. In addition, periodic examinations of workers (especially adolescent girls) should be conducted for early detection of diseases of the musculoskeletal system, initial changes in posture and other disorders. Arterial hypotension, all forms of anemia and metabolic disorders are contraindications to work in silkworm fattening.

4. Artificial local exhaust and supply ventilation with air conditioning should be installed in all production shops.

5. In order to avoid the dust entering the papillary rooms, the silkworm plants must have a set of amenity rooms isolated from production and equipped with a separate entrance: rooms for eating, dressing rooms, showers and toilets.

6. In the period of papilionage one should use dust-proof respirators such as RH 19 or "Lepestok".

7. Dry cleaning of rooms by hand is prohibited. It should be done with the help of a vacuum cleaner..

8. It is recommended to provide the workers of silkworm plants with hot and cooled green and black tea, carbonated water (it should be taken into account that due to the content of caffeine, tannin and vitamins, green tea has a pronounced tonic effect). Great importance should be given to a rational and balanced diet.

9. It is forbidden to use the labor of girls under 18 years of age at the silkworm plants according to the "List of jobs with hard and hazardous working conditions, which prohibit the use of the labor of persons under 18 years of age".)

10. Weight of lifting and carrying weights for women must not exceed 9 kg, and manual transportation on carts or wheelbarrows - 50-60 kg[5].

Reference.

1. Voytenko V.P., Polyukhov A.M., Barbaruk L.G. et al. // Biological Age, Heredity and Aging. Kiev, 1984. pp. 5-15.
2. Iskandarov TY, Ibragimova GZ, Iskandarova GT, Feofanov VN, Shamansurova HS, Tazieva LD. Sanitary rules, norms and hygienic standards of the Republic of Uzbekistan №0294-11 "Maximum allowable concentrations (MAC) of harmful substances in the air of the working area". -Tashkent, 2004. – p.53.
3. Iskandarov T.I., Ibragimova G.Z., Shamsurova H.Sh., Slavinskaya N.V., Iskandarova M.S., Demidenko N.M., Iskandarova G.T., Parsegova L.G, Feofanov V.N. Sanitary rules, norms and hygienic regulations of the Republic of Uzbekistan #0141-03 'Hygienic classification of working conditions according to the indicators of harm and danger of factors of the industrial environment, the severity and intensity of the work process'. - Tashkent, 2004. -p. 53.
4. Iskandarov T.I., Slavinskaya N.V. Sanitary rules, norms and hygienic standards of the Republic of Uzbekistan № 0324-16 "Sanitary and hygienic norms of the microclimate of production premises. -Tashkent, 2016. – p.10.
5. Iskandarov T.I., Slavinskaya N.V. Sanitary rules, norms and hygienic norms of the Republic of Uzbekistan № 0364-18 "Norms of acceptable loads for girls under 18 years old and women when lifting and moving weights manually". -Tashkent.2018. – p.9.
6. Nichkasov V.M., Iskandarov T.I., Ibragimova G.Z., Slavinskaya N.V., Iskandarova G.T. "Methodology of evaluation of working conditions and certification of workplaces by working conditions". -Tashkent, 1996. -p.21.
7. Order No. 200 of the Ministry of Health of the Republic of Uzbekistan, dated 10 July 2012, "On Approval of the Provisions on Medical Inspections of Employees". 8.8. 8. Construction Norms and Regulations 2.01.05-98 "Natural and Artificial Lighting". - Tashkent, 1998. -p.48.