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Biological and Technological Indicators of Partenoklons

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Annotation: The article defines the biological and technological indicators of parthenoklones. According to the analysis results, the yield of parthenogenetic caterpillars varies within 75.33-91.33%, which indicates a low control compared to the bisexual SANIISH-30 breed; the technological indicators of parthenoklones are quite high. The metric number of the 5140pk clone reaches 3991 units, and the A-218pk - 3827 units. The cocoon unwinding of the A=238 pc clone is 85.88%, and the A-261 clone is 86.54%. The silk yield of A-153pk is 48.81%, and A-261pk is 49.7%.

Keywords: Hybrid, parthenoklon, economic effect, biological indicators, technological indicators.

Isogenous female parthenoklones can be used as a breeding stock for interbreeding. B.L. Astaurov wrote about such an opportunity. The advantages of using parthenoklones for interbreeding are as follows.

1. The F1 hybrid obtained from crossing female parthenoklon with males of the common breed differs from common hybrids by greater endurance and uniformity in all traits.

2. The genetic constancy of female parthenoklones allows for the exclusion of labor-intensive, expensive breeding work in research institutions and breeding stations.

3. The presence of single females in parthenoklones is also beneficial for production, as it allows for the preparation of 100% purity hybrid seeds without resorting to labor-intensive, expensive, and very inaccurate separation of females from males during the cocoon stage for interbreeding purposes.

The economic effect from the preparation of hybrid eggs with the participation of parthenogenetic females will be a large sum. Hybrids from the crossbreeding of parthenogenetic females with

ordinary males of other breeds are distinguished by high quality (Table 1).

Table 1. Characteristics of silkworm hybrids obtained from crossing SANIISH 30 breed parthenoklon females with S-5 breed males

Hybrid	Floor	Viability, %		Macca		Silkiness, %	Silk mass yield, %
		embryonic	postembryonic	cocoon g	shells, mg		
Тетрагибрид 3 (контроль)	♀♂	97,0	98,5	2,15	482	22,4	100,0
ПК 51-40 х С- 5	♀♂	98,7	95,6	2,15	533	24,8	112,7
ПК 153 х С-5	♀♂	99,0	98,2	2,08	301	25,2	117,7

From the data presented in Table 1, obtained under good ecological conditions for raising caterpillars, it follows that the new hybrids, in terms of viability, silk content, raw silk yield, and other indicators, surpass the control hybrid Tetrah hybrid 3. Under stricter conditions, this difference will be even greater.

Under production conditions, this hybrid yielded 74 kg of cocoons per egg box compared to 64.5 kg of the control hybrid Tetrahybrid 3. For the first time in the history of world sericulture, production tests have proven the possibility of preparing hybrid seeds from parthenoklones and the high productivity of the hybrids obtained from them under production conditions.

As a result of station tests, the best hybrid combinations involving parthenoklones have been identified. These hybrids were once accepted for testing by the State Commission for Crop Testing.В таблице 2 приведены биологические показатели созданных клонов тутового шелкопряда.

Table 2. Biological indicators of parthenogenetic clones

Clone naming	Parthenogen yield, %	Lifespan of caterpillars, %	Cocoon weight, g	Shell weight, mg	Silk content, %
А-153 пк	75,33±0,33	89,1±1,91	1,90±0,056	402±13,05	21,2±0,12
А-218 пк	87,0±0,29	82,7±1,21	1,90±0,042	394±9,54	20,6±0,175
А-238 пк	89,5±0,65	82,7±0,87	1,80±0,018	368±1,76	20,4±0,196
А-261 пк	87,67±2,41	90,0±1,18	1,91±0,09	370±14,4	19,4±0,250
51-40 пк	86,02±0,86	89,1±1,04	1,86±0,07	368±16,38	19,8±0,29
9-пк	80,0±1,92	88,5±1,27	1,61±0,07	354±12,8	20,7±0,23
43-пк	85,4±0,83	85,9±1,88	1,81±0,06	355±31,4	21,8±0,32
29-пк	91,33±77	95,9±1,20	1,74±0,09	238±10,02	13,7±0,25
САНИИШ-30 (к)	97,6±0,56	82,7±1,43	1,66±0,013	3,31±4,35	23,6±0,199

As can be seen from the table, the yield of parthenogenetic caterpillars varies within 75.33-91.33%, which is lower than that of the control two-sexed SANIISH-30 breed. This can be explained by the fact that the clones are represented by females, and they are less productive. Cocoon weight varies from 1.61 g to 1.91 g, shells from 238-402 mg, and silk content from 13.7 to 21.8%. The APK, 9pk, A-153pk, A-218pk, 51-40pk clones, which are widely used for hybridization, deserve special attention.

Figure 1 shows the cocoons of parthenogenetic clones.

Figure 2 shows female partheniclon butterflies.

Fig.1. Parthenogenetic female silkworm cocoons

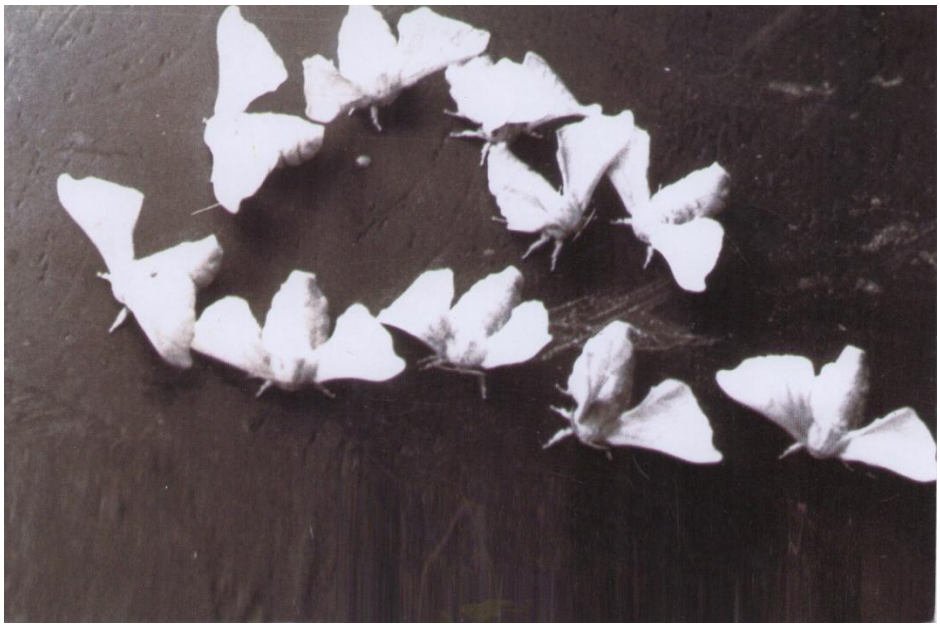

Fig. 2. Constant homogeneous butterflies - female clones

As mentioned above, parthenogenetic clones are represented by female individuals, which affects biological indicators, as male silkworms are 15-16% more silky compared to females, and their viability is higher.

Below, we present a table with variation coefficients for biological traits (Table 3).

Table 3. Coefficients of variation of biological traits of parthenogenetic clones

Clone name	Viable. goose., %	Mass		Cocoon silk content, %
		cocoon, g	shell, mg	
A-153 пк	6,59	7,88	7,90	1,44
A-218 пк	8,20	5,26	8,84	12,80
A-238 пк	5,2	5,38	12,52	0,38
A-261 пк	16,6	3,19	4,27	2,84
51.40 пк	9,34	4,19	5,32	3,08
113 пк	6,11	8,80	5,98	2,44

The table data indicate that variations in biological characteristics are not large, confirming the homogeneity of the parthenogenetic clones. In the following table, we present the technological analysis of parthenoklones (Table 4).

Table 4. Technological indicators of parthenoklones

Names. Klonov	Mass of dry coc., y.	Exit		Metrich. Number, units.	DNRKN, m.	We stretch., %	Production. Length, m.
		raw silk,%	Silk ed				
A-153 пк	0,630	41,27	48,81	3110	6681	84,55	831
A-218 пк	0,537	35,24	42,11	3827	571	83,69	735
A-238 пк	0,599	36,64	42,90	3541	595	85,88	804
A-261 пк	0,542	43,02	49,71	3663	627	86,54	864
51.40 пк	0,521	37,04	46,06	3991	585	80,42	731
113 пк	0,460	33,70	41,66	2859	576	82,88	914

From Table 4, it follows that the technological indicators of parthenoklones are sufficiently high. The metric number of the 5140pk clone reaches 3991 units, and the A-218pk - 3827 units. The cocoon unwinding of the A=238 pc clone is 85.88%, and the A-261 clone is 86.54%. The silk yield of A-153pk is 48.81%, and A-261pk is 49.7%.

Such high technological characteristics of the cocoon thread once again confirm the value of cocoons as components for hybridization, as clones not only ensure heterosis and stability of biological indicators, but can also improve the technological properties of the silk thread.

Figure 3 depicts 113pk and 29pk clone cocoons, which may also be of interest to breeders. These are yellow-coconut clones.

Fig. 3. Clone-113 cocoons on the left, Clone-29 cocoons on the right

In Figure 3.5.3 - Clone-29 and Clone-113 cocoons. These clones were obtained more than 80 years ago. The viability of the caterpillars is very high, with a silk content of 14.5-15.0%. They consist of one female. They are used for breeding work.

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