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METHODOLOGY OF HIGH-MOUNTAIN CONDITION PREPARATION

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Abstract: *Athletic training at non-standard altitudes should be considered as a powerful factor contributing to optimal racing performance. High-performance training has its own features that sports professionals need to take into account to achieve the desired positive result. Acclimatization in the broadest sense of the word is the process of adapting living organisms to changed conditions of existence. Sports training at non-standard altitude conditions should be seen as a powerful factor that contributes to optimum realization in racing conditions. We recommend yearly conducting high-mountain training of each athlete. From our observation, 90% of the elite athletes of Bulgaria have used the high-mountain training every year. The training activities in high-altitude conditions have its own peculiarities, which sports specialists need to take into account in order to achieve the desired positive result. Two thousand meters above sea level is recommended as an optimal altitude when conducting high-level training for athletes. Major adaptations are made on a 20-day stay, and acclimatization at altitude occurs in two main phases*.

Key words: *high-mountain preparation, condition, training program.*

1. Introduction

Sports training at non-standard altitude conditions should be seen as a powerful factor that contributes to optimum realization in racing conditions.

The training activities in high-altitude conditions have its own peculiarities, which sports specialists need to take into account in order to achieve the desired positive result.

Acclimatization in the broadest sense of the word is the process of adapting living organisms to changed conditions of existence.

Altitude acclimatization is an adaptation to the altitude climatic conditions and, above all, to the reduced oxygen pressure in the atmospheric air.

Practice shows that conducting training activities at altitude conditions led to the occurrence of the physiological state of exaltation, during which the functionality of the body is increased. This positive post-hypoxic effect can be used in sports practice and, in particular, in achieving optimum results during a competition. Knowing the mechanisms of action at altitude conditions contributes to the

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creation of a correct training methodology with positive results [4,5,6,7].

Two thousand meters above sea level is recommended as an optimal altitude when conducting high-level training for athletes. Major adaptations are made on a 20-day stay, and acclimatization at altitude occurs in two main phases.

The first phase of acclimatization covers three to seven days. This is the acute period of acclimatization, which creates significant difficulties for the body. During this period, the training takes place with reduced volume and with low-intensity training exercises. During the second phase of acclimatization (7th to 20th day), the subjective phenomena subsided. There is a more stable functional state and increased working capacity. During this period, training with a gradual increase in training volume and gradual increase of the intensity of the training loads were conducted.

The interval of recovery between training exercises is inversely proportional. At the beginning of the period, the breaks between the training exercises should be greater as they gradually decrease as in these conditions restorative processes are delayed.

For the performance of the athlete in high altitude, for a more efficient acclimatization period and for better results, some key factors are essential:

– Degree of training;
– Whether the use of high mountain training is initial or multiple.

The positive effect of high-mountain training is based, in a figurative way, on the athlete's struggle with hypoxia, as a result of which the body mobilizes the reserves of oxygen-supply systems.

- Breathing increases;
- Improved alveolar ventilation;
- Improves pulmonary blood circulation;
- Increases the minute volume of the heart;

Redistributive changes are performed, providing more blood to organs that are most sensitive to oxygen deficiency - central nervous system, heart, and working muscles.

Upon descending from the mountain, during the re-acclimatization period, the athlete's body is placed under mild conditions. In the first days after descending from the mountain (1-3 days), there is an increased working capacity of the athlete, increased mood and desire for training. In those days, athletes also have very good results. It is advisable to plan to participate in a race these days. In the next 4-5 days, athletes' working capacity is declining. In this period (up to the 8th day of descent from the mountain), it is recommended not to plan competitions, controls and training to be reduced in volume and intensity. The training tools to be diversified, more emotional in nature to attract interest.

After the 8th day of descent, the athlete's ability to work progressively increases. The recovery was rapid, can tolerate higher loads than before altitude training and on altitude training itself. The period is suitable for participation in a competition. The duration of the phase of increased working capacity may be 1 to 2 months. It is now up to the trainers to show skill and flair to use this condition of the athlete and to carry out an adequate training process. Our observations show that the method of preserving the high functional performance of the organism after the descent from the mountain is the intensive training regime. This way, the entire increased functional capacity of the

body is optimally used. The use of enhanced functionalities is the safest method of preserving and expanding this capacity.

The effect of high mountain training will be maintained for a longer time when the training load after descending from the mountain increases in volume and intensity and reaches its maximum limits.

Table 1

Exemplary week training program for the conditioning preparation during the general preparatory period of the first macro cycle

Day		Contents	Dosage
Monday	In the morning	1. Light warming up run	1000 m
		2. Special run exercises against slope	5 × 300 m
		3. Segment work against slope	300 m walking
		4. Stretching in the sport hall	15-20 min
	In the afternoon	1. Games for worm up	30 min
		2. Jumps	
		· Successive step bounces	5 × 20
		· Bouncing by the left and right leg	5 × 10
		· Successive step bounces	5 × 20
		· Bouncing for the ankle along stairs	3 × 10
		· Side bounces above bench	3 × 20
		· Bouncing the rope for the ankle	3 × 50
		3. Game for relaxation (volleyball)	15-20 min
Tuesday	In the morning	Light warming up run	1000 m
		Special run exercises	
		Small steps run	3 series × 20 m
		Run by highly raised knees	
		Small step run with raising up the knee of the left and right leg	3 series × 20 m
		Lower abdominal exercise	3 series × 20 m
		Segment run against slope	3 series × 30 m
		Rest between the series 4-6 min	
			4 × 30 m
			4 × 40 m
			4 × 60 m
			3 × 100 m
		Light run	800 m
Wednesday	In the morning	Specific training for technique	
		1. Light warming up run	1200 m
		2. Special run exercises against inclination	
		· Run by knees high up	5 × 50 m
		· Lower abdominal exercise	5× 100 m
		Rest between the run exercises 4-5 min, between the repetitions	
		3. Segment run against inclination	
		Segments are performed freely	5 × 100 m

Day		Contents	Dosage
Thursday	In the morning	4. Stretching in the sport hall	30 min
		1. Fitness	1 h
		2. Game (football, basketball)	30 min
		1. Cross	50-60 min
		1. Physical restoration (sauna)	3 × 10 min sauna with cold shower after the sauna bath (6-8 min)
		2. Swimming for relaxation	20 min
Friday	In the morning	1. Light warm up run	1000 m
		2. Rate run against inclination	150 m
		Active rest - going back by walking.	200 m
			300 m
			300 m
			200 m
			150 m
		3. Stretching in the sports hall	20 min
		Specific training for technique	
		1. Light run	1000 m
		2. Round about training for general physical preparation	
		3 series from the following exercises are performed with a rest of 5-6 min between the series while the exercises within the series are performed one after the other.	
		· Exercises above obstacles	
		· Exercises with medical ball	
		· Exercises with a piece of elastic	10 obstacle s × 10 exercises
Saturday	In the morning	- Small step run at site	10 exercises × 10 pcs
		- Running with knees high up at site	
		- Exercises for the tensors of the coxofemoral, knee and ankle joint by the support of a bench	40 sec
		· Lower abdominal exercise	30 sec
		· Presses up	
		· Bounces with a rope for the ankles	10 pcs for each leg .
			30 m
			20 pcs
			30 pcs
Sunday		1. Game	1 h
		2. Physical restoration (sauna)	3×10 min sauna with cold shower after the sauna, bath (6-8 min)
		High mountain excursion or walking along cross country	1-2 h

2. Dangers

It is extremely dangerous if the coach specialists are not familiar with the mechanism of acclimatization and re-acclimatization in alpine preparation.

Then the effect may be negative and may be obtained the so-called deadaptation - disturbances in the normal course of acclimatization (functional collapse).

Functional collapse is expressed in reluctance to workout, fatigue, overexertion, reduced performance, increased heart rate, insomnia, etc.

It is important to consider individual abilities and preparedness of the body of the individual athlete and whether the athlete goes first to altitude camp. Altitude experience from the previous year's reduces acute acclimatization period (the first phase of acclimatization) [1, 2, 3].

3. General preparatory period

Conditioning training during the preparatory period of the first macro cycle and particularly during the general preparatory period, occupies substantial place within the general training load.

The correlation between the conditioning and specific work during this period of the preparation provides superiority for the conditioning one - approximately 70% to 30%.

It is known that the degree of the physical preparation is an important factor for achieving good sports results in the various sports.

The tasks of the general physical preparation are as follows:

- To improve the general endurance.
- To increase the general strength.
- To improve the general strength endurance.
- To improve the elasticity of the muscles and the mobility of the joints.
- To train the maintenance of correct posture of the body.
- To educate will for manifesting maximum efforts.
- To increase the stability of the attention and effort.
- To improve the speed and the coordination of the movements.
- To master the skill for freedom of executing movements.

General task of the general preparatory period is the improvement of the general physical preparation of the athlete basically through improving the *general endurance* and setting up the basis of the *general strength.*

To improve the *endurance* of the competitors during the general preparatory period, the following training means shall suit:

- Cross
- Fartlek
- Varying run
- Interval run.

The uniform, varying and interval run methods are most suitable for improving the endurance.

The intensity of performing the training exercise is approximately 75%. It is advisable that training is performed in open air and barred locality, the terrain should be varying (up, down, flat). That provides the possibility for improving the strength and flexibility of the ankle joints

which is particularly important for the good realization of the taekwondo athletes. These exercises appear as well as prophylactics of the micro and macro traumas of the ankle joint, which is characteristic for this sport.

4. Conclusions

We recommend yearly conducting high-mountain training of each athlete. From our observation, 90% of the elite athletes of Bulgaria have used the high-mountain training every year.

Appropriate periods for the use of high-mountain preparations are during the general winter preparatory season, and the descent from the mountain coincides with the start of the special-preparatory period. This is motivated by the fact that during the winter general training period the basic training volume is made and the base of the athlete's functional training is laid. During this period, the main goal of the high-mountain training must be achieved - improving the oxidative processes in the body.

In the special-preparatory period, the great volume of loads and intensity are improved. These are mainly training loads for the development of speed endurance and all its varieties. Speed and power loads have a lesser impact on breathing and blood circulation and are therefore less relevant at this time [8].

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