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**THE NAVAL PENTATHLON – A COACHING PROGRAM FOR**  
**THE SEAMANSHIP RACE**

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***Abstract***

Introduction: Currently, at the national level, there is no scientific methodology for approaching the specific naval pentathlon training in the seamanship race. Aim: For integration into the sports performance existing in the Euro-Atlantic military structures, it is necessary to establish a uniform concept, in terms of structure and content, of the coaching program. Objectives: Developing marine skills, in combination with other motor qualities and in line with the training sessions, will increase performance of the naval pentathlon team. Participants: Our experimental study included two groups of subjects: a group non-involved in performance sports activity and a group involved in performance sports activity, namely the experiment group – the representative naval pentathlon team of the “Mircea cel Bătrân” Naval Academy in Constanta. Results and conclusions: The correlation between the results obtained from testing the features of the five seamanship races can be attributed to training programming, which plays an important role in the development of specific skills. The experimental group shows statistical differences between the two tests at  $p < 0.001$ , in all applied tests. The results of scientific research for the general parameters of psychomotor training (neuro-psychomotor skills, sensory skills, intellectual skills – focused attention) relative to the assessment scales highlighted statistically significant differences at  $p = 0.05$ . The results obtained in our investigation confirm that the model proposed for the structure and content of the macrocycle represents a logical line in the preparation for seamanship race.

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**Keywords:** Military student, naval pentathlon, seamanship race.



## 1. Introduction

Nowadays, naval pentathlon is one of the 26 sports disciplines organised under the auspices of the International Military Sports Council (CISM), including regional, continental and world competitions. It consists of five races:

- obstacle race (a specific naval event);
- life-saving swimming race;
- utility swimming race;
- seamanship race (marine skills);
- amphibious cross-country race (running, shooting, grenade throwing, water passage with rubber boat).

The title of individual champion is determined by summing up the results in the five races. The winning team is nominated by summing up the individual results of its members.

The competition system includes: the International Nautical Championship – organised annually by the Turkish Naval Academy in Tuzla; the Continental Championship and World Championship – organised annually; every four years, the Military World Games (2016, Vietnam), all competitions being organised and coordinated by the CISM.

In this context, the Romanian naval pentathlon has become a necessity imposed by the modernisation and connection of the military system to the international political and social requirements. Under these circumstances, we are facing a multitude of shortcomings in making up a representative national naval pentathlon team, in terms of periodisation (Bompa, 2002; Platonov, 2015), structure and content of a specific training system, for participation in the 2017 International Nautical Championship.

To comply with the international performance criteria for naval pentathlon, developing the performance capacity (Teodorescu, 2009) of the representative team is the main starting point in the training of military athletes from the “Mircea cel Bătrân” Naval Academy (ANMB) in Constanța. Thus, we aimed to design a training program for the seamanship race based on the periodisation of training, according to the international competition calendar (Teodorescu, 2007), with a focus on developing the coordination ability, speed and strength (Tudor, 2008), on the one hand, and improving the rowing technique, on the other hand, because the seamanship race includes five specific features (CISM, 2009):

1. Start: moving on a 5x5m platform situated at 2 meters from start;
2. Work on the mast: using a Boatswain’s chair, the competitor hoists himself up to a plate fixed to the top of the mast in a vertical position, at 6m height from the ground, and puts five wooden pegs (20cm long and 3.5cm thick) into the corresponding holes of the plate, which are marked in specific colours;
3. Hauling a cable: the cable, which is 10m long and 10-15cm thick, must be hauled through the water;
4. Heaving lines: a heaving line is thrown and fixed to the pontoon with a bowline knot. It weighs 200g and is thrown 15m away within a 10m corridor. Three attempts are allowed;
5. Slalom rowing around buoys: five buoys are anchored 15m from each other, and the competitor must pass each of the five buoys four times during the two laps in the race. The total length is 90m, and the first buoy is at the distance of 30m.

Points are awarded according to the scoring table provided by the CISM competition regulations.

## **2. Problem Statement**

Starting from the fact that, at the national level, there is no scientific methodology for approaching the naval pentathlon training and no legislative/leading body, namely a national military naval pentathlon federation that proposes scales and selection criteria, as well as training and competition models, we think it is necessary to establish a unitary concept, in terms of structure and content, with training objectives specific to performance athletes in the Euro-Atlantic military structures, who participate in naval pentathlon competitions.

## **3. Research Questions**

Assessing the strength of association (correlation) between the results obtained from motor tests and the five seamanship features can assign the training programming a decisive role in the development of marine skills.

The design and implementation of a specific physical training program can significantly improve performance indicators for the skills required by the five features of naval pentathlon seamanship.

Planning the training of military athletes participating in the seamanship race over a macrocycle (6 months) will lead to the achievement of superior results in competition.

## **4. Purpose of the Study**

In our research, we shall introduce a new content into the training plan designed for the representative naval pentathlon team of the “Mircea cel Bătrân” Naval Academy. Operational systems, in all their variety, become extremely effective means used in the psychomotor training aimed to develop the skills and abilities needed for specific events, such as military naval pentathlon. They are also testing tools so necessary for the most efficient orientation of military athletes towards pentathlon, in the case of the seamanship event. The exercise specificity is a prerequisite for the periodisation of training and designing the model of training and competition for participation in the 2018 International Nautical Championship, Tuzla, Turkey. A final goal of the research is to achieve a design model, a useful methodology for screening and then monitoring military students involved in naval pentathlon.

These proposals of our research require the following stages:

1. Identification of the information sources necessary to approach the research, extracted from both the bibliography on the topic addressed (*PTC Military Pentathlon, Appendix*, 1950; 1954; 1955; 1963; 1972; 1980; 1987) and the records achieved by the ANMB physical education teachers for the groups of military students.

2. Analysis and dynamics of the results recorded by the ANMB representative team between 2014 and 2016 at the International Nautical Championship organised annually by the Turkish Naval Academy in Tuzla;

3. SWOT analysis, in order to identify the strengths and weaknesses in the 2014-2016 competitions;

4. Defining and establishing the size of the sample of subjects to be tested and choosing the sampling method;
5. Drawing conclusions from the research.

## 5. Research Methods

The research methods used were (Thomas & Nelson, 1996; Tudos, 2015): bibliographical study; pedagogical observation; pedagogical experiment; mathematical and statistical method for data processing and interpretation; graphical representation method. At the same time, we assessed the general physical preparation of athletes. To assess their level of training, as an expression of the development level of each motor quality, we used an international test for the physical fitness, known as the Standard Fitness Test. From this test, we chose the following events: 50m speed run; standing long jump; endurance run (800 m); push-ups.

Because, in our country, a selection system with control standards is used in naval pentathlon, we have included special tests for the general physical training: swimming (50 m); scapular mobility; coxofemoral mobility. In our research, we also used tests for assessing specific physical sailing skills. These tests aimed at the five moments of the race. Psychomotor testing targeted three categories of skills: neuro-psychomotor skills and co-ordination; sensory skills; intellectual skills. The statistical and mathematical method was based on the IBM SPSS Statistics 20 program for processing the recorded results and the model of training and competition for naval pentathlon athletes.

The experimental sample consisted of 15 students, military athletes, namely the Romanian naval pentathlon team; the control group, with the same number of subjects, represented the reserve team of our country. The selected military students have 5 to 6 years of sports experience in athletics and swimming.

## 6. Findings

Within the research, we developed a macrocycle training program and implemented it in the preparation of the ANMB representative team participating in the 2016 International Nautical Championship held in Tuzla, Turkey (Table 01).

**Table 01.** A microcycle training model for the naval pentathlon athlete competing in the seamanship race

Mesocycles	Introductory	Introductory for recovery	Basic	Precompetitive	Competitive	Total
Weeks	3	4	13	4	2	<b>26</b>
No. of workouts/ week	2	2	3	2	2	<b>11</b>
Total workouts/ mesocycle (hours)	6 (12)	8 (16)	39 (78)	6 (12)	4 (8)	<b>63 (126)</b>
M1 - Start: moving on a 5x5m platform situated at 2 meters from start.	1 hour	1½ hour	5 hours	1 hour	1 hour	<b>9½ hours</b>
M2 - Work on the mast: using a Boatswain's chair, the competitor hoists himself up to a plate fixed to the top of the mast in a vertical position, at 6m height from the ground, and puts five wooden pegs (20cm long and 3.5cm thick) into the corresponding holes of the plate, which are marked in specific colours.	1½ hour	2½ hours	10 Hours	1½ hour	1 hour	<b>16½ hours</b>

M3 - Hauling a cable: the cable, which is 10m long and 10-15cm thick, must be hauled through the water.	1½ hour	1 hour	4 hours	1½ hour	½ hour	8½ hours
M4 - Heaving lines: a heaving line is thrown and fixed to the pontoon with a bowline knot. It weighs 200g and is thrown 15m away within a 10m corridor.	2½ hours	4½ hours	9 hours	1½ hour	1 hour	18½ hours
M5 - Slalom rowing around buoys: five buoys are anchored 15m from each other, and the competitor must pass each of the five buoys four times during the two laps in the race. The total length is 90m, and the first buoy is at the distance of 30m.	5½ hours	6½ hours	50 hours	6½ hour	4½ hours	73 hours
<b>TOTAL</b>	<b>12</b> hours	<b>16</b> hours	<b>78</b> hours	<b>12</b> hours	<b>8</b> hours	<b>126</b> hours

### 6.1. Assessment of general physical training in the seamanship race

As an expression of the development level of each motor quality, we applied in this study, for the objective assessment of general physical training, seven parameters from athletics and swimming, sports practiced by the military athletes before being selected for the national pentathlon team. At the end of the research, the test application generated changes in the performance averages achieved for most parameters (Table 02). Representative performance averages were obtained in the final testing for the 50m freestyle swimming, scapulohumeral mobility and coxofemoral mobility in the frontal plane. Mean differences between the two groups in the final testing are significant at  $p = 0.01$  and  $n-1$  degree of freedom, in favour of the experimental group (for the above-mentioned tests,  $t$  has the values 2.22, 2.65, 2.85 > 2.13 at  $n-1$ ).

**Table 02.** Comparative analysis of group averages characterising the general physical training of military athletes – Final testing

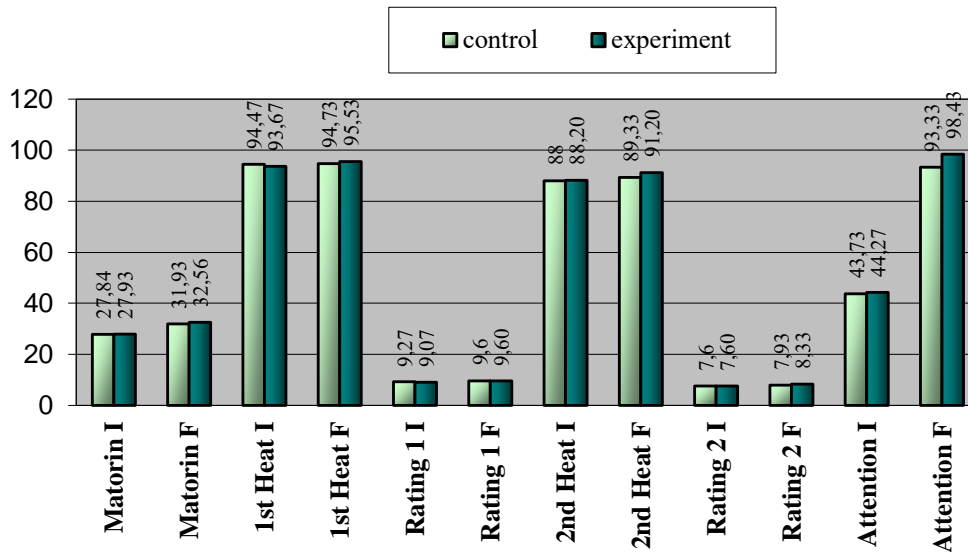
Item no.	Compared parameters	$\bar{X} \pm m$		Criteria	
		Control group	Experiment group	"t"	"p"
1	50m Sprint (sec)	7.00 ± 0.04	6.90 ± 0.04	2.00	>0.05
2	Standing long jump (cm)	249.60 ± 1.15	252.00 ± 0.84	1.69	>0.05
3	800m Run (sec)	130.00 ± 0.46	128.00 ± 0.46	2.10	>0.05
4	Push-ups (no.)	27.80 ± 0.53	29.00 ± 0.69	0.69	>0.05
5	50m Freestyle swimming (sec)	36.20 ± 0.07	36.00 ± 0.07	<b>2.22</b>	<0.05
6	Scapulohumeral mobility (cm)	78.00 ± 0.84	75.00 ± 0.77	<b>2.65</b>	<0.05
7	Coxofemoral mobility in the frontal plane (cm)	1.80 ± 0.06	2.00 ± 0.05	<b>2.85</b>	<0.05

### 6.2. Assessment of specific physical training in the seamanship race

**Table 03.** Comparative analysis of averages characterising the general training of military athletes – Final testing

Item no.	Compared parameters	Statistical indicators					
		Control group		Experiment group		Criteria	
		$\bar{X} \pm m$	$\bar{X} \pm m$	"t"	"p"		
I	Test for neuro-psychomotor skills (spatial coordination)						
1	Matorin Test (degrees)	319.33 ± 2.69	325.67 ± 2.15	<b>2.84</b>	<0.05		
II	Heat/Rating Test (points)						
1	1 <sup>st</sup> Heat (points)	94.73 ± 0.38	95.53 ± 0.30	<b>2.66</b>	< 0.05		
	Rating (grade)	9.20 ± 0.28	9.60 ± 0.25	<b>2.35</b>	< 0.05		
2	2 <sup>nd</sup> Heat (points)	89.33 ± 0.53	91.20 ± 0.53	<b>2.38</b>	< 0.05		
	Rating (grade)	7.93 ± 0.21	8.33 ± 0.27	<b>2.44</b>	< 0.05		
III	Intellectual skills - Focused attention – Figures						
1	Attention - (no. of signs) - (rating)	93.33 ± 1.54 poor - maximum limit	98.43 ± 1.23 moderate - maximum limit	<b>2.58</b>	< 0.05		

The results achieved in this test were converted into grades, according to the scoring scale (Table 03). The percentage increase from the initial testing to the final testing (Figure 01) was in favour of the experimental group, whose score was close to the maximum limit of the “good” rating. The grades awarded in the final testing are expressed by an average result equal to 9.20 for the control group and 9.60 for the experimental group. In the second heat, the subjects put the pegs into the holes in the same position as in the first heat, after a 30-second break during which they maintained the line of sight blindfolded – for the experiment group.



**Figure 01.** Dynamics of the results in general psychomotor tests

**Table 04.** Comparative analysis of group averages characterising the self-control ability of military athletes involved in the initial and final tests

Item no.	Features assessed	Control group		Criteria		Experiment group		Criteria	
		Initial testing	Final testing	“t”	“p”	Initial testing	Final testing	“t”	“p”
1	Start – first buoy (30m)	22 sec.	21 sec.	1.19	>0.05	20 sec.	16 sec.	<b>2.18</b>	<0.05
2	First buoy – last buoy slalom (60m)	55 sec.	52 sec.	0.69	>0.05	51 sec.	44 sec.	<b>2.58</b>	<0.05
3	Last buoy – first buoy slalom (60m)	50 sec.	47 sec.	1.35	>0.05	45 sec.	39 sec.	<b>2.22</b>	<0.05
4	Rowing in a straight line to the last buoy (60m)	42 sec.	40 sec.	1.05	>0.05	40 sec.	35 sec.	<b>2.65</b>	<0.05
5	Removing the connecting shackle	16 sec.	14 sec.	0.14	>0.05	14 sec.	7 sec.	<b>2.85</b>	<0.05
6	Rowing in a straight line to the first buoy (60m)	40 sec.	37 sec.	0.74	>0.05	38 sec.	31 sec.	<b>2.59</b>	<0.05

The recorded and statistically processed results of the experimental group (Table 04) are statistically significant at the 0.05 significance threshold for all five features of the seamanship race. This demonstrates

the effectiveness of the training program developed and applied during a macrocycle to the experimental sample – the representative naval pentathlon team.

## 7. Conclusion

By testing general physical training in this experimental stage, we have found that, in the final test, the differences in performance averages for some tests (50m freestyle swimming, scapulohumeral mobility, coxofemoral mobility in the frontal plane) are significant at  $n-1$  and  $p = 0.05$ ;  $p = 0.01$ , in favour of the experiment group. The obtained results demonstrate that, in the experimental group, general motor qualities have improved, in terms of level and pace of evolution, due to the implementation of the training program, which is optimal as structure and content. Analysis of the data obtained from the specific psychomotor testing, namely the self-control ability testing in the 90m race performed in a Pioneer oar boat, highlighted significant results for the experimental group in all five features under assessment. The reliability of the research is scientifically substantiated by the increased value of the recorded average times, in favour of the experiment group. Thus, the research hypotheses have been confirmed.

From the statistical processing and the analysis of the obtained results, we can state that the proposed macrocycle model represents, by its structure and content, the logical, rationalised line of the training process for athletes participating in the seamanship race.

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