

**MINISTRY OF NATIONAL EDUCATION  
NATIONAL UNIVERSITY OF PHYSICAL EDUCATION AND SPORT  
BUCHAREST**



**PhD Thesis Summary:**

**ASPECTS REGARDING PHYSICAL PREPARATION ON EFFORT ZONE  
IN THE RUGBY GAME AND THEIR INFLUENCE ON PERFORMANCE  
CAPACITY**

**PhD Professor:**

**GHEORGHE MARINESCU**

**PhD Student:**

**ADINA ANDREEA DREVE**

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In the last years, rugby at a global level had a gloomy evolution from all points of view, especially with regard to the dynamics and aggressiveness of the game, aspects argued by the speed of each phase of the game.

These aspects can easily be seen in a world top team, through technical tactical virtues, but above all through players' physical potential, expressed by elevated levels of speed, strength and resilience.

The tumultuous development of science through the emergence of new testing devices and the improvement of existing ones have made the physical level of players improve. Also, following rigorous scientific testing, we can set up customized and standardized programs to improve effort capacity.

In the last century, rugby has evolved from a technical point of view, tactically and physically, every day, a challenge for coaches and all involved in this phenomenon. It is game characterized by technical subtleties, tactical cuticle and physically complex development.

Interdisciplinary communication with other sporting disciplines such as athletics, gymnastics, weightlifting and fighting sports helps us bring the player's physical condition to a high level.

Today, the complexity of players' action must be as broad as possible, imposed by the rhythm and phases of the game where players are spontaneously involved.

In this thesis, we want to investigate physical training in areas of effort, an idea challenged by some apologists in the field, who claim that training on effort areas is specific to cyclical disciplines. Erroneous assertions, because "total" training on powers and effort capacities perfectly fits into collective sports disciplines, games, martial arts, and disciplines where the acyclic effort is predominant.

This thesis is structured in three parts: the first part contains last-minute aspects of the literature and research of the field worldwide. The six chapters deal with physical training on rugby endeavors, the description of physical rugby play posts and periodical aspects detached from the latest research in the world.

Part Two - Preliminary research has three chapters where we relate physical fitness analysis to rugby performance at under 19 national team.

The third part of the final research includes the stimulus program that I applied and the diagnosis made after the application of this program.

### **Part I THEORETICAL FUNDAMENTATION OF THE RESEARCH**

Contains six chapters: Chapter I Motivation of the choice of topic, the degree of actuality and the stages of the research (three subchapters motivation of the choice of topic, the topicality of the theme, the stages of the research).

Chapter II The evolution and the history of the rugby game (two subchapters the history of the rugby game internationally and the history of the rugby game on a national level).

Chapter III General and specific aspects of the performance and effort capacity in the rugby game (seven subchapters performance capability, physical effort and effort capacity, physical effort in rugby play, ergogenesis of physical effort in

rugby play, systematization of effort, energetic chains of ATP resonance - powers and capacities, systematization of effort zones).

Chapter IV Morpho - Functional and Motoric Particularities of Rugby Players on Compartments and Posts (two subchapters describing the forwarding compartment and the three - compartment).

Chapter V Aspects of physical training and periodization in the rugby game (five subchapters, aspects of physical training, effort size and dynamics, preparatory, pre-competitive, competitive and transition period) and chapter VI Conclusions and novelties from the theoretical part.

We present some conclusions from the first part of the thesis:

Regarding the training of strength and aerobic capacity, we draw some conclusions:

- In these areas, peripheral and central factors are required
- The number of repetitions of the exercises ranges between 1.30 - 10 minutes, time made by long intervals with active pauses for collective sports, combat or.
- In any acicular sport, mixed VO<sub>2</sub>max training at central level and AA at peripheral level, recruiting type II muscle fibers will include intensive exercises 1.2-1.4 of VAM, but submaximal by AA, from 5 - 15 sec. with active restoration of equal or lower duration of time allocated to the execution
- It is recommended that the training time be 30 minutes or more, with the first activation phase - heating for 10 - 30 minutes. and a pause to return to 120 beats / min.
- We also want to bring back the novelty part about the rugby game, the training in the VO<sub>2</sub>max area and the conditions for fulfilling the requirements:
- Using the training method with brackets to maintain series stability, even if the training load is high
- Most of the time, the VO<sub>2</sub>max and VO<sub>2</sub> DRIFT concepts are confused, resulting in training errors in the sense that they work in a lower effort area.
- Rugby is a game that requires a high intensity of phases interfered with power and technical executions. The three power sources are used during the game in different proportions.
- From the point of view of the motoring qualities, of major importance is the speed under all its forms of manifestation, strength-power couple, endurance and resistance both in terms of capacity and power.

*Part II Testing exercise effort to rugby players under 19 - preliminary research. It includes three chapters Chapter VII Organization and conduct of preliminary research. Chapter VIII. Results of preliminary research and data interpretation. Chapter IX Conclusions of the preliminary investigation Conclusions of the preliminary investigation.*

### **Premises for Preliminary Research**

The premises for the design of the preliminary research in defining the objectives, goals, tasks and research hypothesis were determined by the lower level of rugby training and the lack of international performance of the junior batches.

### **The objective of the preliminary investigation**

In setting the objective, account was taken of the periodic training of the national group reflected in the training plan in correlation with the physical training program - stimulation in close connection with the actual requirements of the specific effort, the somatic features and some components of the effort capacity.

Taking into account the above-mentioned issues, we have proposed the following objectives:

- Finding the current level of the physical potential of the players included in the research;

### **Purpose of the preliminary investigation**

The goal reside in finding the means to achieve the objectives, so the purpose of the preliminary research is to prepare a report comprised of physical tests to determine the current level of physical training at the level of the National junior teams.

### **Tasks of the preliminary investigation**

- Establishment of the research group;
- Choice of tests for assessment of specific physical training in the rugby game;
- Establishing the research hypothesis;
- Establishment of the periodicity required for preliminary research;
- Recording the data and compiling the physical profile of the players;
- Designing a database on the results and performance of the tests;
- Consultation of some bibliographic sources regarding the tests in the rugby game as well as in the planning of specific physical training.

### **Preliminary research hypothesis**

*„Diagnosis of physical training level provides information on effort capacity and subsequent sports performance. ”*

### **Subjects, place and time of preliminary research**

The subjects included in the preliminary research are members of the National Team of Romania under 19 (1996), selected from the National Team component teams as well as players working in the teams from abroad. The preliminary research was done with the approval of the Romanian Rugby Federation and the National Lot Coaches. The National Team operates at the National Base Complex Silistea Snagov. The Preliminary Study Division assumed testing on a sample of 30 players between 16.06 and 30.06.2015

### **Conclusions of preliminary research**

Following preliminary research, we have drawn the following conclusions:

- Preliminary testing reveals that National U.19 players are physically below the minimum standards that the Rugby Federation has established in line with the international level;
- We find that the training in the upper aerobic area has been absent so far, fact confirmed by the values Vo2max recorded during the test;
- Technical tactical mastery can be expressed with elevated indices, only if the aerobic effort is at a higher level;
- It is recommended that speed training be performed in conjunction with aerobic upper training;
- After testing the exercise capacity, the Vo2max level and the setting of the maximum aerobic speed, we have determined the means and work intensities for the next stage;
- Based on the preliminary research, we can state that the effort capacity tests provide information about the current situation of the players and provide us with essential information for the individualized periodization for future periods;
- All tests and tests provided us with objective information about the current situation in which we find out and confirmed the preliminary research hypothesis: *„Diagnosis of physical training level provides information on effort capacity and subsequent sports performance. ”*

### **Part III Applying the training program - stimulating effort zones to the players of the national team under 19 and organizing the final research**

It consists of four chapters, Cap. X. Organizing and conducting the final research. Chapter XI. Results of final research and data interpretation. Chapter XII. Conclusions and elements of originality detached from the final research. Chapter XIII. Dissemination of results and research boundaries

#### **The premises of the final research**

The premises behind the conception of the final research in defining the objectives, goals, tasks and the research hypothesis were determined by the lower level of training of rugby players and the lack of performance at the international level of the junior teams. Thus the established premises are:

- Increasing sports performance in recent years is the result of scientifically conducting the training process;
- Contemporary training tends to become a science, based on the effort, in the desire to have greater efficiency in the training process;
- In the last years, the sports training has new methods and means, resulting from the latest research in the field, regarding the specificity of the effort in the rugby game;
- The optimization of individualized physical training is done taking into account the observance of some norms and methodologies, resulting from the new scientific researches;
- The need to know the level and specificity of the effort capacity for rugby players and the verification of the results of the effort training programs to improve the physical level;
- The diminishing of the physical training level has repercussions on the other factors of the training;
- The monitoring of the tests leads to the understanding and identification of the effort zones, which subsequently helps to improve them;
- Driving capacities are developing and educating;
- The development of conditional and coordinating motric capacities condition the attainment of sporting skill;

#### **The objectives of the final research**

Taking into account the above-mentioned issues, we have proposed the following objectives:

- Development of superior aerobic capacity with an emphasis on the specific motor skills specific to the rugby game;

- Diagnose the current level of the physical potential of the players included in the research after applying the stimulus program;
- Developing the sense of acceleration and speed of travel, qualities indispensable to the rugby game;
- Achievement of zoning effort in the rugby game;
- Development of detention, the quality required predominantly for the players participating in the fixed moments of the game;
- Improvement of the training methodology by approaching the effort areas in the physical training;

### **The purpose of the final research**

The aim is to find the means to achieve the goals, so the purpose of the final research is to follow the progress of the players involved in the research.

### **Tasks of the final research**

The experimental approach involves the establishment and fulfillment of tasks that contribute to the rigorous and valid representation of the results, so the tasks are:

- Establishment of the research group;
- Choosing the tests to assess the specific physical training in the rugby game;
- Establishing the research hypothesis;
- Establishment of periodization required for preliminary research;
- Recording of the data and shaping of the physical profile of the players;
- Designing a database on the results and performance of the tests;
- Achievement of zoning effort in the rugby game;
- Consultation of some bibliographic sources related to the tests in the rugby game as well as in the planning of specific physical training;

### **The hypothesis of the final research**

*"Stimulating motor performance with personalized and systematized means of effort zone, leads to improved results."*

Conclusions and elements of originality detached from the final research:

- The effort zoning test in the rugby game has positive effects in terms of individualized training and increased effort capacity according to individualized zoning;
- Means of high intensity and low volume have high efficiency in resistance training at this age;

- The presence of the effort individualization on the metabolic areas of effort leads to the efficient support of the effort during the game and implicitly to the achievement of the performance;
- Decrease in adipose tissue at the end of the training period is significant and influences, as has been seen, the increase in muscle mass. The majority of the differences are negative. Differences vary between -6.4% and 1.5%;
- Significant increase in the average maximum aerobic speed at the end of the training period shows an increase in aerobic capacity. From the statistical analysis we observed that all athletes have progressed, the differences between VAM results in the two tests are between 0.5 and 4 km / h. ;
- By analyzing the results we have obtained, we conclude by saying that the use in training of individualized methods and means according to the metabolic zoning of the effort, leads to the optimization of the performance capacity in the whole process of preparation, thus the hypothesis of the final research "*Stimulating motor performance with personalized and systematized means of effort zone, leads to improved results.*" has been confirmed;
- All the work done in this thesis, led to an objective evaluation of the effort capacity in the rugby game and helped us to determine the optimal means of training on effort areas;
- We specify that following this training the National Rugby Team under 19 won the second place at the European Championship in Lisbon in the same year