

MORPHOLOGICAL ASPECTS OF FORWARDS IN THE RUGBY GAME RELATED TO TASKS AND POSITION

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ABSTRACT. The aim of this study is to identify and underline the morphological particularities of Romanian elite rugby players from the forwards compartment. This aspect can contribute to the improvement of training contents. The hypothesis of this study is that morphological particularities of forwards vary depending on tasks and position in the same manner as in the case of elite players from other countries. The study included the players of a selected team, which comprises the best players of the Romanian championship. Among the 32 tested players, 17 are forwards. Evaluations were done by positions, and we drafted tables with arithmetic means and standard deviations for each position. We took several anthropometric measurements for the rugby players, thus determining the qualitative level of the body mass between the four positions of the compartment. Findings indicate that players have a certain level of morphological adaptation to specific effort by the post they occupy within the team. The players feature a hypertrophy of the muscle tissue, a phenomenon specific to strength sports. However, some of the players also had a significant amount of fat mass, which contributes to less impressive performances.

Keywords: *fat body mass, lean mass, forwards*

REZUMAT. *Aspecte morfologice ale pachetului de înaintare în jocul de rugby, raportate la post și sarcini.* Scopul acestui studiu este reprezentat de identificarea și evidențierea specificului morfologic al jucătorilor profesioniști de rugby din România, aspect ce poate contribui ulterior la îmbunătățirea conținutului antrenamentului. În realizarea acestei lucrări am pornit de la premisa că valorile de masă și compoziție corporală ale înaintării se încadrează în standardele optime ale acestui sport. Studiul s-a desfășurat pe jucătorii unei echipe, selecționată a celor mai buni jucători din campionatul intern. Din cei 32 de sportivi testați, 17 sunt jucători ai compartimentului de înaintare. Evaluările au fost făcute pe posturi, mediile aritmetice și abaterile standard la nivelul fiecărui post au fost întabelate. S-au efectuat măsurători antropometrice ale jucătorilor de rugby,

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determinând nivelul calitativ al masei corporale între sporturi. Rezultatele indică faptul că jucătorii au un nivel de adaptare morfologică la efortul specific, în funcție de postul ocupat în echipă. Jucătorii testați prezintă o hipertrofie a țesutului muscular, fenomen specific sporturilor de forță. Cu toate acestea, stratul de țesut adipos este mare, la unii dintre jucători, fapt ce contribuie la diminuarea performanțelor sportive ale acestora.

Cuvinte cheie: *țesut adipos, masă activă, înaintare*

Introduction

Performance physical effort determines adaptive variations of the human body as a whole, starting with the somatic nervous system, coordinator of voluntary movement and in charge with vegetative functions (cardiovascular, respiratory) and endocrine-metabolic functions, responsible for ensuring the energetic substrate of muscular effort.

There are numerous studies (Drăgan, 2002; Duthie, 2006; Gabbett, 2005) in the scientific literature concerning the adjustment capacities of rugby players, mostly in countries with rugby tradition. In Romania, this subject has not been approached very much by specialists, considering the low popularity of this sport.

For this reason, in the following lines, we will outline the positions of the forwards compartment of the rugby team:

- The forwards, comprised of 8 players:
 - *first line* – 2 props and a hooker;
 - *second line* – two players;
 - *third line* – two flankers and a lock.

The demands of each position are so diverse, that team unity is essential in attaining the objectives. Generally, rugby is a sport for all shapes and sizes, but it is also a sport of individual attributions and skills.

Purpose

Considering the low popularity of this sport in Romania, there have been only a few assessments of players' exercise and effort adjustment capacity. For this reason, we decided to conduct certain morphological tests on rugby players within the first Romanian league. We compared the results between teams, compartments, positions, and our findings to those of existing studies and to the biological model of top players.

The purpose of this study was to identify and highlight the morphological particularities of professional rugby players in Romania, which can contribute to an improvement of training contents.

In this paper, we focus on the adjustment of rugby players' body composition to game-specific effort.

Hypothesis

In this investigation, we have started from the idea that the tested morphological particularities values of the forwards varies within the optimal standards for this sport.

The second hypothesis is that the body density of the third line is better than the rest due to their more "aerobic tasks" during the game.

Material and methods

This study comprised anthropometrical measurements of the players and recordings of adjustment conditions specific to rugby.

The study was conducted on the players of an elite team, which comprises the best players of the Romanian championship.

Among the 32 tested players, 17 are forwards and 15 backs. Evaluations were done by positions, and we drafted tables with arithmetic means and standard deviations for each position.

Among the morph functional measurements, we will highlight the following:

- body mass;
- height;
- brachial skin fold thickness;
- subscapular skin fold thickness;
- intercostal skin fold thickness;
- abdominal skin fold thickness;
- femoral skin fold thickness.

Body composition was calculated by using the methods of the five skin folds on the right side of the body. We also conducted a bioelectrical impedance test. Through both these testes, we calculated the amount of lean and fat mass, as well as their percentages.

Results and discussions

In the following lines, we will compare and discuss the results obtained by the forwards, by positions and by each anthropometric index. The data were introduced into graphs for a better emphasis on the relations between the five positions of this category.

Table 1. Morphological results of the forwards

	Position	Age (years)	Weight (kg)	Lean body mass (kg)	Lean body mass (%)	Body fat (kg)	Body fat (%)
MEAN	PROP	24	112	83	74	29	26
S.D.		3,0	4,9	2,0	3,5	5,2	3,5
MEAN	HOOKER	22	107	80	75	28	25
S.D.		2,8	1,4	7,8	6,4	6,4	6,4
MEAN	LOCK	22	112	86	77	26	23
S.D.		1,7	6,2	6,1	5,4	7,0	5,4
MEAN	FLANKER	22	102	84	83	18	17
S.D.		1,9	3,4	2,2	2,6	3,1	2,6
MEAN	NO.8	22	102	84	83	18	17
S.D.		1,9	3,4	2,2	2,6	3,1	2,6

The mean ages by positions for forwards range between 21 and 24 (Fig 1). The means by positions are below those of previous studies, which generated results above 26 years old (Duthie et al., 2006). The players with the highest mean age are the props, but they also range below the mean of the professional level for this position. The lowest mean was that of the number-eights – 21, which can indicate a deficit of strength on the level of this category, as it is known that the climax of strength is reached after 25, and strength is the basic motor quality of the forwards. Furthermore, the game experience has a very important role in the activity of this category. Nonetheless, a low mean age can be to the advantage of this category, as it brings more agility and vitality.

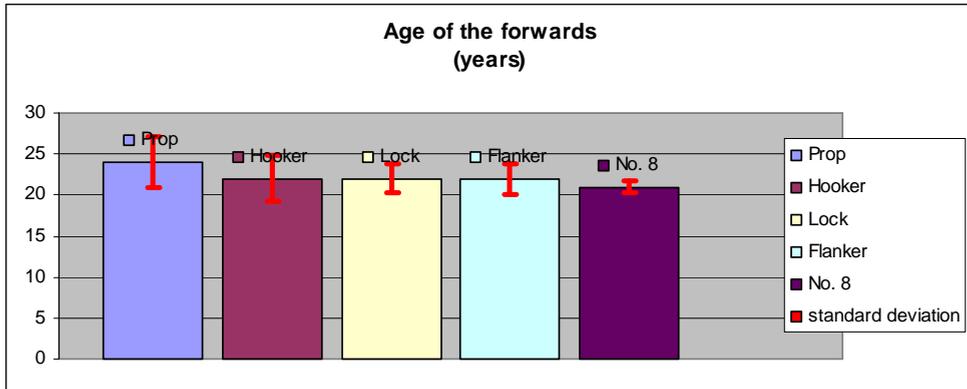


Fig. 1. Age of the forwards

The body mass of the players of this category is large. The forwards of rugby teams are among the heaviest athletes, similar to the weight throwers, wrestlers and heavy weight lifters, or with other athletes whose main skill is strength.

The mass of the forwards we have studied is close to the weight indices resulted from the tests conducted previously of professional rugby players. As seen in Figure 2, the biggest weight was that of props and locks, as they are the pillars of the scrum. The means of the five forwards coincide to the ideal weight values for this category (Drăgan, 2002; Gabett, 2005).

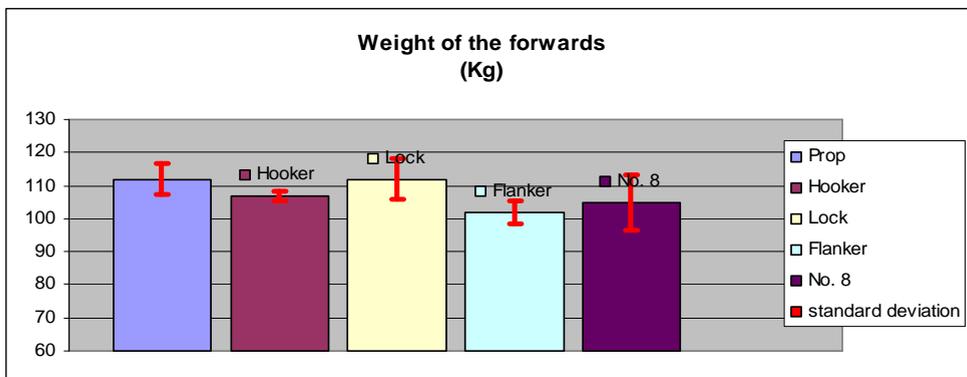


Fig. 2. Weight of the forwards

Body composition is a very important factor in the physical development of the athletes. Depending on the percentage of lean mass and body fat, the athletes can achieve or not the performances they have set in mind.

The forwards of a rugby team are athletes with large body mass, as their prevailing motor skill is strength (Clarke, 1995). Nonetheless, the body fat must be lower than the muscular tissue, considering that the rugby game requires a predominantly aerobic energy.

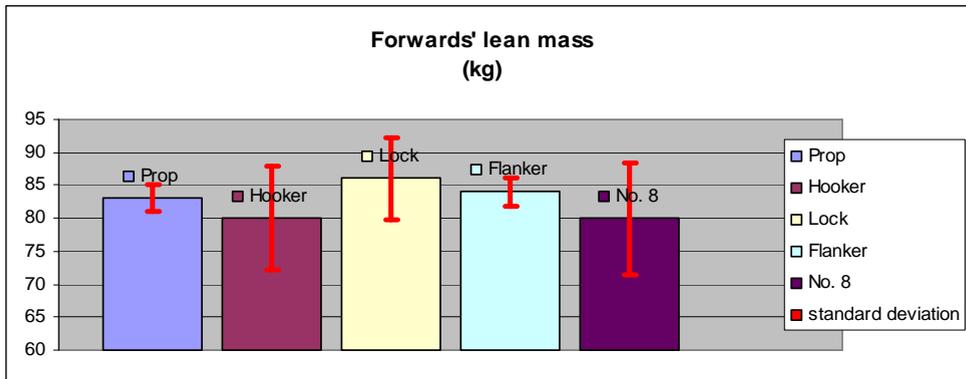


Fig. 3. Lean mass of the forwards

The lean mass means of the forwards is presented graphically (Fig. 3); the results are as follows: the props 83 kg, the hookers 80 kg, the locks 86 kg, the flankers 84 and the number-eights 80 kg. Though they have obtained a low arithmetic mean, number-eights had a high standard deviation, which reduces the value of the arithmetic mean; this was also observed in case of the hookers.

Regarding the lean mass percentage, the players of our study have obtained the following results: the props 74%, the hookers 75%, the locks 77%, the number-eights 77% and the flankers 83%. (Fig. 4) We notice that the values are close; only flankers scored above 80%. The results are below the ideal values of the players of this category; the only ones who scored four units below the value were the flankers (Drăgan, 2002). Furthermore, the locks and the hookers had a high standard deviation: some of the players are closer to the ideal values for these positions. Though the props and the locks had a large amount of lean mass, their percentage is lower than that of their teammates, which can indicate a deficit in the body density of these players.

The amount of body fat is large for the athletes of this category, with the following results: the props 29 kg, the hookers 28 kg, the locks 26 kg, the number-eights 25 kg and the flankers 18 kg. (Fig. 5) We notice that flankers are the only ones with a mean below 20 kg, as well as a low distribution of the individual values.

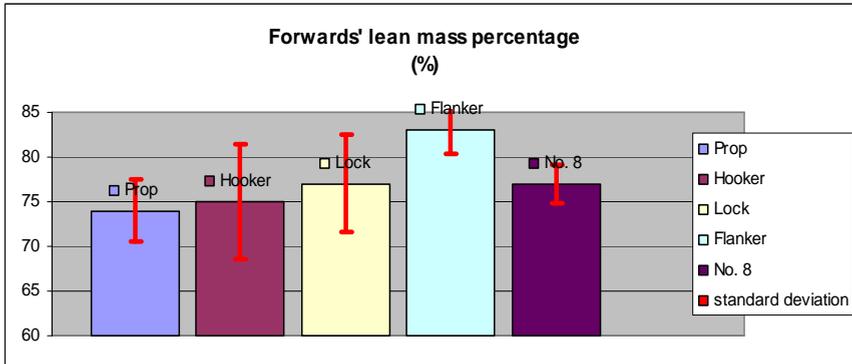


Fig. 4. Percentage of forwards' lean mass

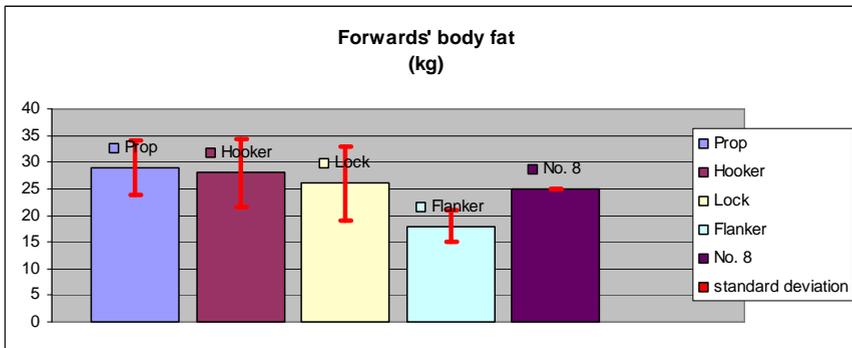


Fig. 5. Amount of the forwards' body fat

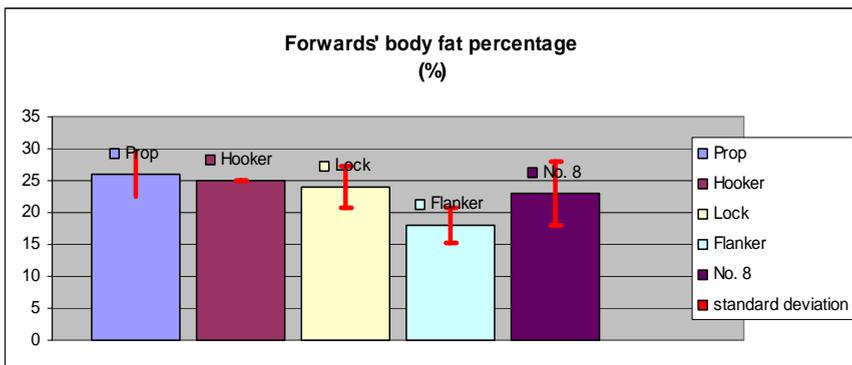


Fig. 6. Percentage of the forwards' body fat

In percentages, the forwards vary as follows: the props 26%, the hookers 25%, the locks 24%, the number-eights 24% and the flankers 17%. (Fig. 6) We notice that the first row players (the props and the hookers) have the highest percentage of body fat, closely followed by the locks and the number-eights. This indicates an excess of body fat to take into account and an ineffective adaptation to the demands of the rugby game for these positions. Flankers are better positioned: only four units above the ideal value for this position.

Conclusions

- The lean mass of the forwards is in the demanded standards, with the exception of the props, whose results are under the demands, considering their tasks based mostly on specific force.
- The fat tissue of the players is higher than normal, results indicating a low specific adaptation due to some lacks in training and nutritional habits.
- The differences between positions and lines are in the favor of the flankers who have a good body density. Props and hookers show a smaller adaptation of the body density. Also the No. 8 shows a poor adaptation, considering their tasks and the long distances they have to cover during the game.

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