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## **The individual profile of the technical-tactical preparation of the World judo Championships in 2010-2011**

**Key words:** judo, individualization, technique and contest tactics

### **Summary**

The indices of technical-tactical preparation allow to describe individual features of the competitors taking part in sport competitions. The value of those indices allows to determine both dominant features of the preparation and its disadvantages.

The Olympics in London in 2012 will gather the best judo competitors, who from May 2010 to April 2012 took part in the classification judo competitions which entitle them to take part in the coming games ([www.ijf.org](http://www.ijf.org)). Which competitors will be qualified for the Olympic Games in London – the results of the qualification competitions will answer that question. Who wins the gold medal during the Games? – Now, we can only assess who has the best chance of winning and determine the features of the technical-tactical preparations of

potential winners in men's judo. The purpose of our work was to determine the features of the technical-tactical preparations (PTT) of four top judo competitors, based on their individual indices.

During World Championships in Paris 2011, and in Tokyo 2010, four competitors won gold medals twice in their weight categories. They were: Sobirov Rishod from Uzbekistan – at under 60 kg, Kim Jae-Bum from Korea at under 81 kg, Iliadis Ilias from Greece at under 90 kg and Riner Teddy from France at over 100 kg. During those championships they totally fought 49 contests, which have been recorded by the audio-video means. They performed 478 attacks, and their opponents did 380 ones. The material was the subject to our analysis.

The methods we have used gave us the ground to determine the value of indices of the individual technical-tactical preparations: “versatility index” which allows to fix the range of the techniques used; “activity index” – which determines the frequency of attacks performed; “effectiveness index” which determines the ratio between attacks executed and efficient attacks, and “efficiency index” which gives the number of points obtained from particular technical actions and points lost from referee's penalties for breaking sport rules ([www.ijf.org](http://www.ijf.org)).

The competitors, subject to our analysis of their individual PTT, manifested significant range of the analyzed indices. J.-B. Kim in 2011, most frequently attempted his attacks (every 15.5” attack), whereas I. Iliadis, in 2011, attacked with low frequency (every 47” attack). T. Riner, in 2011, executed most often efficient attacks (every 112.5” efficient attack); and J.-B. Kim, in 2010, executed rarely efficient attacks (every 373.2” efficient attack). As we compare the frequency of performed attacks at World Champs 2010 and World Champs 2011, we can see that Sobirov and Kim improved that value, whereas Iliadis and Riner had a worse value. The frequency of efficient attacks was improved in Sobirov, Kim and Riner and Iliadis were worse. R. Sobirov manifested the highest range of the techniques used and Riner the least did. J.-B. Kim had the highest intensity of attacks and I. Iliadis the lowest intensity. T. Riner and I. Iliadis had the highest value of the effectiveness indices, whereas J.-B. Kim and T. Riner had the lowest value of those indices. T. Riner had the highest value of the efficiency. J.-B. Kim opponents most often obtained penalty points.

The value of indices as determined at the World Championships in 2010 and 2011, allowed to determine the individual features of the technical-tactical preparation which affected the sport judo contests and gave sport success.

## Introduction

Classification of judo competitors for the Olympic Games in London 2012, was commenced in May 2010 and ends in April 2012. During that period judo competitors take part in many competitions as: world championships, continental championships, masters tournaments, grand slam, grand prix and world cups – in 56 sport competitions in total where they can gather classification points to the Games in London. Competitors gathered the most points at the World Championships in Tokyo 2010, and in Paris 2011; so, that was the reason that four competitors have been selected, who had won gold medals in both those championships.

Four these competitors: R. Sobirov, J.-B. Kim, I. Iliadis and T. Riner had already been medalists at the Olympic games, world and continental championships. They have first positions at the rankings to the London Olympic Games and they are believed the main competitors at the Olympics. Theirs descriptions have been presented below:

Rishod Sobirov – Uzbekistan, born on 11.09.1986 – under 60 kg.

The most important sport successes:

3<sup>rd</sup> place, the Olympic Games 2008

3<sup>rd</sup> place, Asian Championships 2009

1<sup>st</sup> place, World Championships 2010

1<sup>st</sup> place, Asian Championships 2010

1<sup>st</sup> place, World Championships 2011

1<sup>st</sup> position at the Olympic ranking 31.12.2011



Fot.1 Rishod Sobirov UZB [en.wikipedia.org/wiki/]

Jae Bum Kim – Korea, born on 25.01.1985, - under 81 kg.

2<sup>nd</sup> place, the Olympic Games 2008

1<sup>st</sup> place, Asian Championships 2008

3<sup>rd</sup> place, World Championships 2009

1<sup>st</sup> place, Asian Championships 2009

1<sup>st</sup> place, World Championships 2010

1<sup>st</sup> place, Asian Championships 2010

1<sup>st</sup> place, World Championships 2011

1<sup>st</sup> place, Asian Championships 2011

1<sup>st</sup> position at the Olympic ranking 31.12.2011



Fot.2 Jae Bum Kim KOR [en.wikipedia.org/wiki/]

Ilias Iliadis – Greece, born on 10.11.1986 (Georgia) – under 90 kg.

1<sup>st</sup> place, the Olympic Games 2004 (81 kg)

1<sup>st</sup> place, European Championships 2004 (81 kg)

2<sup>nd</sup> place, World Championships 2005

2<sup>nd</sup> place, world Championships 2007

1<sup>st</sup> place, World Championships 2010

3<sup>rd</sup> place, European Championships 2010

1<sup>st</sup> place, World Championships 2011

1<sup>st</sup> place, European Championships 2011

1<sup>st</sup> position at the Olympic ranking 31.12.11



Fot.3 Ilias Iliadis GRE [en.wikipedia.org/wiki/]

Teddy Riner – France, born on 7.04.1989 (Guadelupe) – over 100 kg.

1<sup>st</sup> place, World Championships 2007

1<sup>st</sup> place, European Championships 2007

3<sup>rd</sup> place the Olympic Games 2008

1<sup>st</sup> place, World Championships 2008 (open)

1<sup>st</sup> place, World Championships 2009

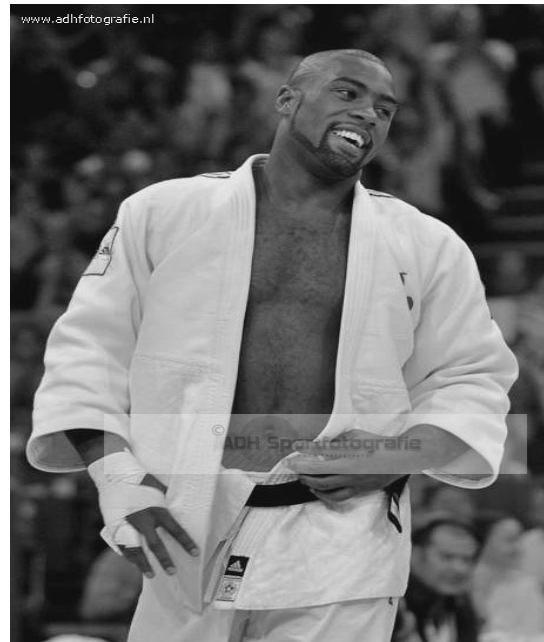
**1<sup>st</sup> place, World Championships 2010**

2<sup>nd</sup> place, World Championships 2010 (open)

**1<sup>st</sup> place, World Championships 2011**

1<sup>st</sup> place, European Championships 2011

1<sup>st</sup> position at the Olympic ranking 31.12.2011



Fot.4 Teddy Riner FRA [en.wikipedia.org/wiki/]

What the PTT features brought them to sport success at the last World Championships. Our research should answer the question.

### **Material and methods**

The opponents of those four competitors, they met during the world Championships 2010 and 2011 and contest time have been presented in tables 1-4. The competitors totally fought 49 contests, which have been recorded by the audio-video means, performing 478 attacks, 51 of that number (27 ippons – completing their contest before regulation contest time) were the efficient ones – referee's points awarded. Their opponents performed 380 attacks, 3 of these attacks were efficient.

Table 1. Opponents and time of contests R. Sobirov (UZB – u 60kg) at the World Championships 2011-2010

contest	Opponents at W. Championships 2011			Opponents at W. Championships 2010		
	Name and give name	Country	Contest time	Name and give name	Country	Contest time
1	Chammartin Ludovic	SUI	5'00"	Gerchev Yanislav	BUL	4'50"
2	Zoungrana Hermann	BUR	3'00"	Jang Jin-Min	KOR	3'30"
3	Kitadai Felipe	BRA	1'24"	Khousrof Ali	YEM	5'00"
4	Mushkiyev Ilgar	AZE	2'35"	Verde Elio	ITA	5'00"
5	Kim Won Jin	KOR	5'00"	Mudranov Beslan	RUS	2'37"
6	Hiraoka Hiroaki	JPN	5'00"	Zantaraja Georgii	UKR	5'00"
Total contest time W. Champ. 2011			21'59"	Total contest time W. Champ. 2010		25'34"

Table 2. Opponents and time of contests J.-B. Kim (KOR – u 81kg) at the World Championships 2011-2010

contest	Opponents at W. Championships 2011			Opponents at W. Championships 2010		
	Name and give name	Country	Contest time	Name and give name	Country	Contest time
1	Otgonbaatar Uuganbaatar	MGL	5'00"	Csoknyai Laszlo	HUN	0'45"
2	Hojakulyev Azizjan	TKM	3'23"	Lucenti Emmanuel	ARG	5'00"
3	Bottieau Joachim	BEL	3'29"	Vasylenko Artem	UKR	2'40"
4	Bischif Ole	GER	5'00"	Elmont Guillaume	NED	6'12"
5	Nifontov Ivan	RUS	5'00"	Takamatsu Masahiro	JPN	5'00"
6	Pietri Loic	FRA	5'00"	Guilheiro Leandro	BRA	5'16"
7	Mrvajevic Srdjan	MNE	5'00"	X		
Total contest time W. Champ. 2011			31'52"	Total contest time W. Champ. 2010		24'53"

Table 3. Opponents and time of contests I. Iliadis (GRE – u 90kg) at the World Championships 2011-2010

contest	Opponents at W. Championships 2011			Opponents at W. Championships 2010		
	Name and give name	Country	Contest time	Name and give name	Country	Contest time
1	Krawczyk Robert	POL	5'00"	Milosevic Nikola	SRB	1'24"
2	Bouyakoub Lyes	ALG	4'03"	Bodaveli Mindia	GEO	5'00"
3	Remarenco Ivan	MDA	1'10"	Ono Takashi	JPN	5'00"
4	Pessanha Hugo	BRA	3'10"	Camilo Tiago	BRA	3'50"
5	Denisov Kiril	RUS	4'15"	Mammadov Eikhan	AZE	2'00"
6	Nishiyama Daiki	JPN	3'31"	Nishiyama Daiki	JPN	1'14"
Total contest time W. Champ. 2011			21'09"	Total contest time W. Champ. 2010		18'28"

Table 4. Opponents and time of contests T. Riner (FRA – + 100kg) at the World Championships 2011-2010

contest	Opponents at W. Championships 2011			Opponents at W. Championships 2010		
	Name and give name	Country	Contest time	Name and give name	Country	Contest time
1	Hernandes Daniel	BRA	1'42"	Kim Soo-Whan	KOR	1'07"
2	Zimmermann Robert	GER	1'55"	Lin Yu-Heng	TPE	1'48"
3	Namsrajav Batsuurl	MGL	2'46"	Sterkhov Dmitriy	RUS	4'30"
4	Bor Barna	HUN	0'35"	Silva Rafael	BRA	1'55"
5	Kim Sung-Min	KOR	0'44"	Takahashi Kazuhiko	JPN	5'20"
6	Toelzer Andreas	GER	3'33"	Toelzer Andreas	GER	5'48"
Total contest time W. Champ. 2011			11'15"	Total contest time W. Champ. 2010		20'28"

The film material was graphically processed, and then the indices were determined for individual assessment of the technical-tactical preparation [Adam, Tyszkowski, Smaruj 2011; Adam 2008], of each of the winners in particular weight categories. The carried-out analysis allowed to determine: the range of techniques: the range of techniques used (versatility), the frequency of techniques performed (activity), the ratio between attempts and attacks

effectively executed (effectiveness), quantity of points scored (efficiency) and quantity of points scored and lost for the referee's penalties.

#### Determining the versatility indices

Entering into individual assessment of technical-tactical preparation we determined the range (value) of techniques used, fixing the indices of general, effective and apparent versatilities. Fixing the range of analyzed techniques was of great importance for the value of that index; and it is a constant denominator for the presented formulas. Considering the judo techniques classification according to the Kodokan Judo [Kano 1994; Daigo 2005], there are 94 techniques (67 throws and 27 grappling techniques). The sport regulations, however, and sport practice limit the number of techniques used. Such techniques as: *kani basami*, *kawazu gake*, *daki age*, *do jime* are forbidden during judo contest: *morote gari*, *kuchiki taoshi*, *kibisu gaeshi*, *kata guruma*, *sukui nage* are limited in their forms; and *obi otoshi*, *yama arashi*, *tawara gaeshi* are hardly seen during sport competitions. In our research we have analyzed 50 techniques used in judo competitions, and that value is a constant denominator of the versatility indices. The value of versatility indices was calculated according to the following formulas:

$$W_o = X_o / X \text{ (x100\%)} \text{ and}$$

$$W_e = X_e / X \text{ (x100\%)}$$

$$W_p = W_o - W_e$$

$W_o$  – general versatility index

$W_e$  – efficiency versatility index

$W_p$  – simulate versatility index

$X_o$  – number of techniques performed

$X_e$  – number of efficiently performed techniques

$X$  – number of techniques which can be executed – they were analyzed in our paper – 50 techniques

#### Determining the activity indices

Activity allowed to determine differences in frequency of between the examined competitor and his opponents [Szepiłow, Klimin 1979; Olejnik, Rożkow, Kargin 1984; Laskowski 2007].

The activity index was calculated in accordance with the formulas:

$$A_a = A \text{ sum} / n$$

$$A_o = a \text{ sum} / n$$

$$AA = A_a - A_o$$



Aa – activity attack index

A sum – number of the recorded attacks of the judoka

n – number of the analyzed contests

Ao – defense activity index (opponents' activities)

A sum – the number of the recorded attacks of the opponents

AA – activity index

Determining the effectiveness indices

We can determine the frequency of efficiently performed throws by using the PTT indices. Effectiveness of attacks and defense was determined as the proportion of attempted attack to successful attacks (attacks judged by referees). The value of those parameters shall be determined, analyzing attack and defense, using the following formulas:

$Ea = AS \text{ sum} / AP \text{ sum} (x100\%)$  and

$Eo = 1 (100\%) - As \text{ sum} / Ap \text{ sum} (x100\%)$

Ea – effectiveness of the attack index

AS sum – the number of efficient attacks of the analyzed judoka

AP sum – the number of attacks performed by the analyzed judoka

Eo – effectiveness of defense index

1 (100%) – value of defense prior to contests

As sum – the number of efficient attacks performed by the opponents of the observed judoka

Ap sum – the total number of the attacks performed by the opponents of the observed judokas.

Determining the efficiency indices

Efficiency index (Sa) and points lost due to referee penalties were determined by analyzing points scored per one contest. Calculation was done in the following way:

$Sa = 5 \times M + 7 \times M + 10 \times M / n$

Sa – attack efficiency index,

5, 7, 10 – scored points at efficient attacks (yuko, wazaari, ippon),

M – number of effective attacks, performed by the examined judokas,

n – number of the analyzed contest.

The classification of technique groups was based on the Kodokan Judo [Kano 1994; Daigo 2005]. The writing forms and the names of judo techniques have been used in accordance with “Kodokan New Japanese-English Dictionary of Judo” by Kawamura and Daigo [2000].

## Results

Sobirov R. (S.R.) had the widest range of techniques used, obtaining the highest value of the indices of general and apparent versatilities at the World Championships in 2011 –  $W_o=48\%$  and  $W_p=36\%$ . The lowest value of these indices, in that year, had T. Riner (R.T.)  $W_o=16\%$  and  $W_p=6\%$ . The narrowest ranges of the techniques used, during the World Championships 2010 were observed in Kim J.-B. (K.J.B.) and Iliadis I. (I.I.)  $W_e=8\%$  (fig. 1). The highest frequency of the attacks performed was observed in a Korean competitor K.J.B., attacking every 19.1 sec. In 2010, and every 15.4 sec. In 2011. He three-time increased his activity attack index (A) in 2011 (fig. 2), this competitor had the lowest frequency of effective attacks in 2010 – performing effective attacks every 373.2 sec. (fig. 5). I.I. had the lowest value of activity index during World Champs in 2011,  $A= -6.83$ , and had the lowest frequency of attempted attacks, every 47 sec. he tried to attack (fig. 2, 5). R.T. most often effectively attacked – performing successful attack every 112.5 sec. (fig. 5). That R.T. had the highest index of efficient attacks at World Champs in 2011  $E_a=28.6\%$  lowest value of this index, in both championships, K.J.K. had.  $E_a=5.1\%$  in 2010 and  $E_a=6.4\%$  in 2011 (fig. 4).

I.I. competitor lost in effectiveness of defense at World Champs in 2010, the value of  $E_o=97.8\%$ , and World Champs in 2011 S.R. competitor  $E_o=96.9\%$  (fig. 3).

The competitors scored most referee's points ( $S_a$ ) for executing throws. R.T. had best efficiency of throws at World Champs in 2010 and 2011, where the *nage waza*  $S_a=9.5$  pts; and the lowest efficiency in 2010, K.J.B. had, the *nage waza*  $S_a=4.83$  pts. opponents lost most points for the referee's penalties during both championships, in 2010 where the penalty  $S_a=3.57$  pts. and in 2011 where the penalty  $S_a=3.86$  pts.

S.R. competitors had the widest range of the techniques used, general versatility increase, in 2011, was observed together with the apparent versatility increase  $W_o=42\%$  and  $48\%$ ,  $W_p=30\%$  and  $36\%$ , whereas effective versatility was at the same level at World Champs in 2010 and 2011,  $W_e=12\%$  (fig.1). The competitor, at World Champs in 2011, had a lower value of activity indices  $A= -0.16$ , whereas in 2010  $A=+2.67$ , effectiveness of attack and defense  $E_a=10.9\%$  and in 2010  $E_a=13.3\%$ ,  $E_o=96.9\%$ ; and in 2010  $E_o=100\%$  (fig. 2, 3). He kept at high level the efficiency of performed attacks  $S_a=9.67$  in 2011 and  $S_a=9.84$  in 2010 (fig. 4).

K.J.B. competitor, among those analyzed, had a very high frequency of attacks performed. His activity index increased in 2011 over three-times, in 2010  $A=3.67$  and in 2011  $A=11.71$

(fig. 2). The value of other indices also increased, namely: general and effective versatility as well as the effectiveness and efficiency of the attacks. In 2010  $W_e=8\%$  in 2011  $W_e=12\%$ ; in 2010  $W_o=36\%$  and in 2011  $W_o=38\%$  in 2010  $E_a=5.1\%$ , in 2011  $E_a=6.4\%$ , and in 2010  $S_a=4.83$  pts., in 2011  $S_a=7.86$  pts. He secured 100% of his efficiency of defense; his opponents had no chance of attacking him. They lost points due to referee's penalties,  $S_a=3.57$  pts., in 2010, and  $S_a=3.86$  pts., in 2011 (fig. 3, 4).

I.I. The competitor had a very high index of efficiency attack, its value increased at World Champs 2011. In 2010  $E_a=14.3\%$ , and in 2011  $E_a=18.5\%$  (fig. 3). His opponents, during the same time, were penalized, and they lost much due to the referee's penalties,  $S_a=1.17$  pts., in 2010 and  $S_a=3.17$  pts., in 2011 (fig.4). In 2011, the value of activity index decreased over three-times. In 2010  $A= - 1.83$ , and in 2011  $A= - 6.83$ . The frequency of attacks decreased in 2010, he attacked every 31.7 sec., and in 2011 every 47.0 sec., (fig. 2, 5). During World Champs in 2011, his indices increased: effective versatility  $W_e=8\%$  in 2010, and in 2011  $W_e=10\%$ ; effectiveness of defense  $E_o=97.8\%$  in 2010, and in 2011  $E_o=100\%$ ; and efficiency  $S_a=7.5$  pts., in 2010, whereas  $S_a=7.8$  pts., in 2011.

R.T. competitor was a world title-holder for the fifth time, defeating all his opponents at World Champs in 2011. He won all his contests prior to elapse of contest time, in total time of 11 minutes and 15 seconds. He achieved the highest value of the efficiency attack index  $E_a=28.6\%$ , performing efficient attacks every 112.5 sec. (fig. table 4). He kept 100% of defense efficiency at World Champs 2010 and 2011. In 2011 he used the last range of judo techniques which did not bring the referee's points, he had the lowest value of apparent versatility index  $W_p=6\%$  (fig. 1).

## **Discussion**

The up-to-now sport achievements of those analyzed judo competitors give them prospect of winning gold medals at the Olympics in London this year. The technical-tactical preparations resulted in winning gold medals at the world Championships in 2010 and 2011. The PTT value of indices allowed to determine their individual features. Kim J.-B. represented an excellent tempo of attacks (pushing his opponents into defensive which resulted in referee's penalties for "passive" attitudes) and very good defense, 100% of defense efficiency, but he achieved low value of efficiency indices.

Iliadis I. achieved negative value of activity index, but he represented the increasing effectiveness of attack and defense during analyzed competitions. His opponents' penalties did not result from the frequency of attack but from his tactical skill.

Sobirov R. and Riner T. had very wide ranges of techniques efficiently performed as well as high indices of effectiveness and efficiency attacks. Especially Riner T. fished off his opponents, at World Champs in 2011, winning all contests prior to elapse of the contest time. He achieved the highest index of efficiency attack and defense. His sport success gives him the best prospect of winning gold medal in the London Olympics in 2012.

But in sport not only great champions win. Foreseeing sport results is quite "risky and unrewarded task". What about the Japanese, who dominated the World Championships in 2010, and they still have high positions in the world of judo, during world championships and Olympic games? Will the competitors from Russia, Brazil, Mongolia or new countries of the former USSR (Georgia, Azerbaijan, Ukraina, Uzbekistan, Kazahstan ...) be able to win medals? They achieved success at the qualifications to the Games 2012 [Adam 2011].

The observations and the analysis of sport competitions have been subject to research for many years [Doi 1967; Andriejew 1971; Sikorski, Mickiewicz, Majle 1987; Jonczyk, Adam 1997; Klocke 2000; Suganami *et al.* 2001; Cynarski 2006; Sterkowicz, Lech, Almansba 2007; Sterkowicz, Lech, Blecharz 2010; Adam, Majdan 2011; Margnes, Paillard 2011]. The authors determined the leading techniques, time structure of judo contest, they also considered coaches' opinions on the efficiency of the particular groups of judo techniques which were used by competitors from different countries and continents. The efficiency of competitors, both women and men, was also considered depending on various weight and age categories. Conclusions taken from those works, were implemented in improving training programmes as well as for individual profiles of the technical-tactical preparations.

### **Summing-up**

Competitors' preparations, who represent the highest sport standards, can be the relevant material to searching for standard value. The individual profiles of the technical-tactical preparations allowed us to determine the value of the indices which describe the features of those preparations. The differentiated value of those indices may be the ground for searching advantages and disadvantages of the preparations.

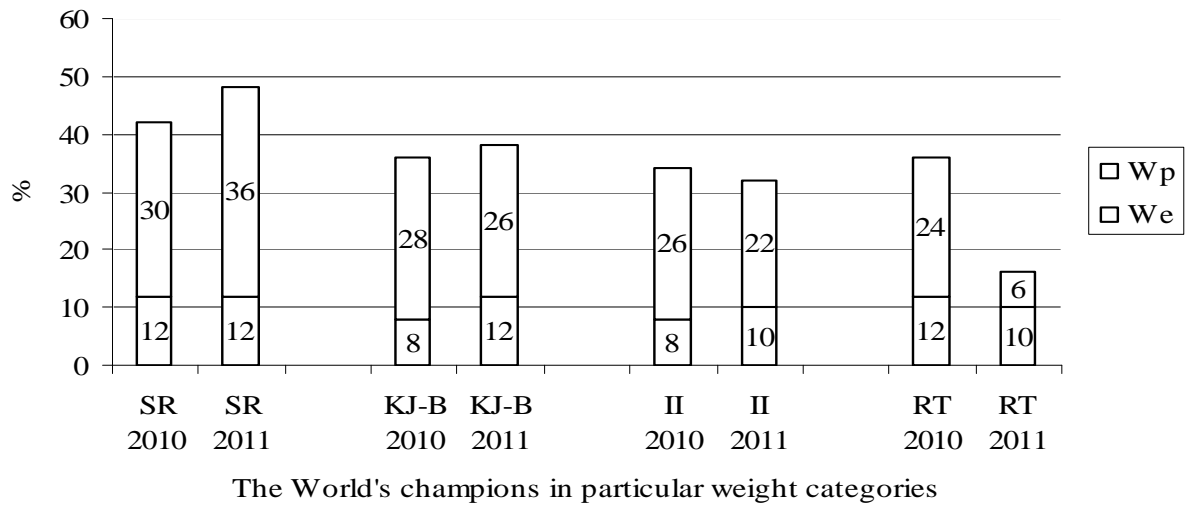


Fig. 1. The value of versatility indices

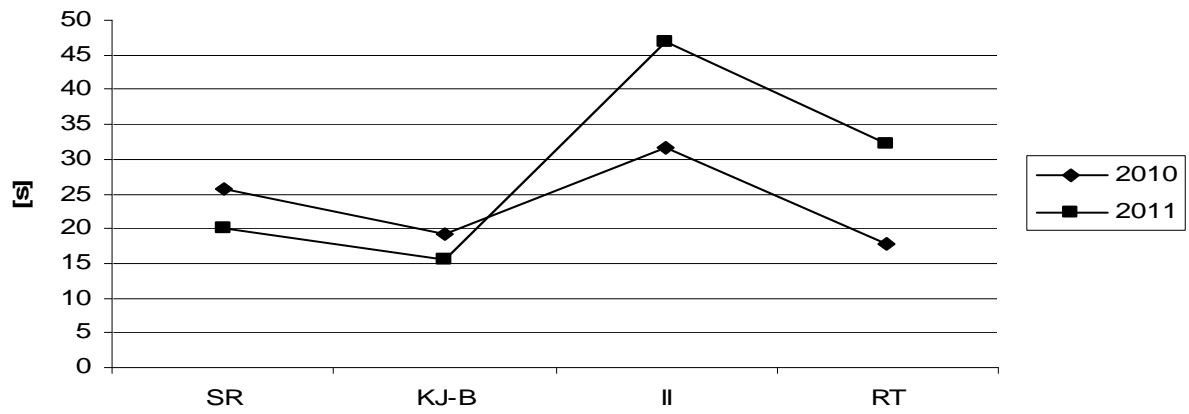


Fig. 2. The frequency of attempted attacks

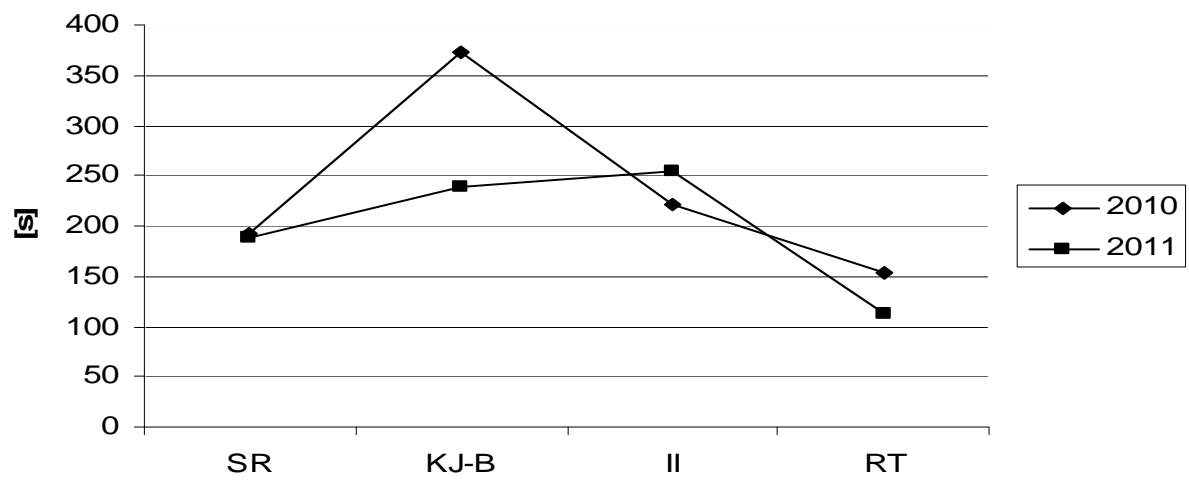


Fig. 3. The frequency of the efficient attacks

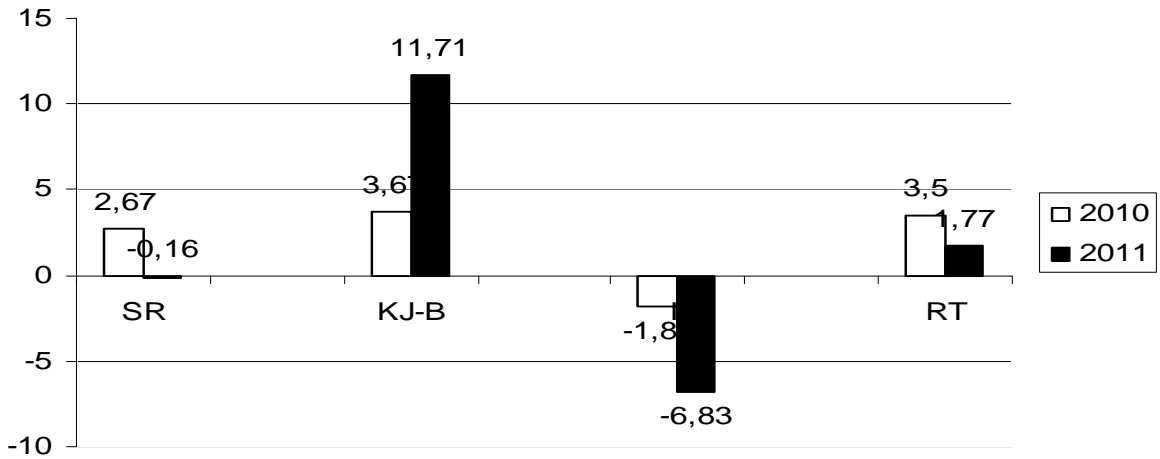


Fig. 4. The value of activity indices

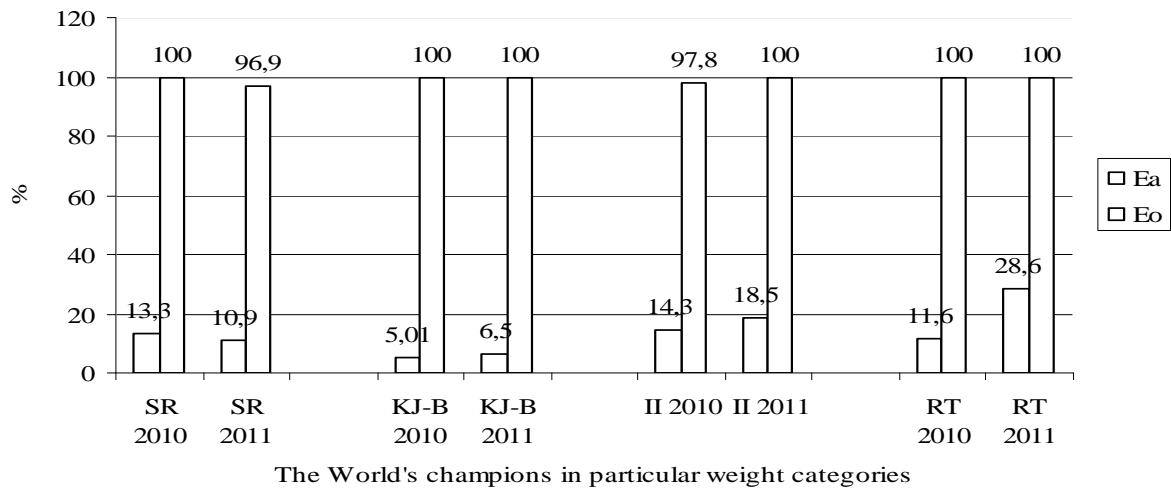


Fig. 5. The value of the indices of attack and defense effectiveness

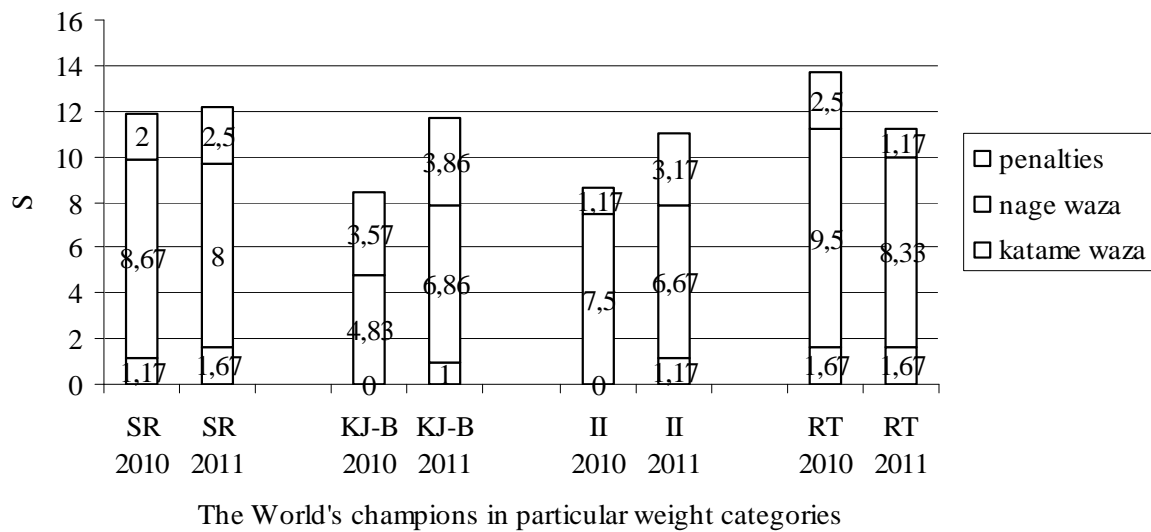


Fig. 6. The value of efficiency indices

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