Validity and reliability of the 30-s continuous jump for anaerobic power and capacity assessment in combat sport

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Abstract

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The Wingate anaerobic test (WAnT) has been established as an effective tool in measuring anaerobic power (AP). It should be pointed out that WAnT was not used to assess anaerobic capacity (AC, i.e., the metabolic energy demand) and may not be appropriate for specific exercise such as continuous jumps. In addition, there is no data on validity of a continuous jumps test in karate sport. This study aimed to determine validity, compared with WAnT as a reference tool, and (test-retest) reliability of a 30s continuous jumps test (CJ30s) to assess AP and AC. Thirteen female Karate kids (age: 11.07±1.32 years; mass: 41.76±15.32 kg; height: 152±11.52 cm; training experience: 4.38±2.14 years) were tested on three separate sessions. The first and second sessions were used to assess the reliability (ICC) of CJ30s, whereas on the third session WAnT was administered. Following CJ30s and WAnT, we assessed AP (w/ CJ30s, as jump height [JH], fatigue index [FI], and blood lactate [BL]; w/WAnT, as mechanical power [P], FI, and BL) and AC (as EPOC). Large/highly significant correlations were found between CJ30s and WAnT EPOCs (r=0.730, P=0.003), and BLs (r=0.713, P=0.009). Moderate/significant correlations were found between CJ30s and WAnT FIs (r=0.640, P=0.014), CJ30s first four jumps mean JH and WAnT peak P (r=0.572, P=0.032), and CJ30s mean JH and WAnT mean P (r=0.589, P=0.021). CJ30 showed excellent and moderate reliability (ICC) for AP (maximal JH 0.884, mean JH 0.742, FI 0.657, BL 0.653) and AC (EPOC 0.788), respectively. Correlations observed especially in terms of AC between CJ30 and WAnT provide evidence that former may adequately assess anaerobic performance level in young combat sports athletes. CJ30 results a reliable test to assess both AP and AC. Further studies may focus on CJ30 validity and reliability in different-level athletes.

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The parents signed a written informed consent form, which was approved by the Ethic Committee of the Faculty of kinesiology University of Split, in accordance with the Declaration of Helsinki.

Title: Validity and reliability of the 30-s continuous jump for anaerobic power and capacity assessment in combat sport

Short title: Wingate and jump tests in Karate kids

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ABSTRACT

The Wingate anaerobic test (WAnT) has been established as an effective tool in measuring anaerobic power (AP). It should be pointed out that WAnT was not used to assess anaerobic capacity (AC, i.e., the metabolic energy demand) and may not be appropriate for specific exercise such as continuous jumps. In addition, there is no data on validity of a continuous jumps test in karate sport. This study aimed to determine validity, compared with WAnT as a reference tool, and (test-retest) reliability of a 30s continuous jumps test (CJ30s) to assess AP and AC. Thirteen female Karate kids (age: 11.07±1.32 years; mass: 41.76±15.32 kg; height: 152±11.52 cm; training experience: 4.38±2.14 years) were tested on three separate sessions. The first and second sessions were used to assess the reliability (ICC) of CJ30s, whereas on the third session WAnT was administered. Following CJ30s and WAnT, we assessed AP (w/ CJ30s, as jump height [JH], fatigue index [FI], and blood lactate [BL]; w/WAnT, as mechanical power [P], FI, and BL) and AC (as EPOC). Large/highly significant correlations were found between CJ30s and WAnT EPOCs (r=0.730, *P*=0.003), and BLs (r=0.713, *P*=0.009). Moderate/significant correlations were found between CJ30s and WAnT FIs (r=0.640, *P*=0.014), CJ30s first four jumps mean JH and WAnT peak P (r=0.572, *P*=0.032), and CJ30s mean JH and WAnT mean P (r=0.589, *P*=0.021). CJ30 showed excellent and moderate reliability (ICC) for AP (maximal JH 0.884, mean JH 0.742, FI 0.657, BL 0.653) and AC (EPOC 0.788), respectively. Correlations observed especially in terms of AC between CJ30 and WAnT provide evidence that former may adequately assess anaerobic performance level in young combat sports athletes. CJ30 results a reliable test to assess both AP and AC. Further studies may focus on CJ30 validity and reliability in different-level athletes.

Keywords: children, metabolic demand, testing, kicking combat sport, phosphagen pathway

INTRODUCTION

The anaerobic capacity (AC) is defined as the maximal amount of energy that can be generated over a given period of time using anaerobic sources of energy (i.e., phosphagen and glycolytic energy pathways) [Green 1994]. It has been well demonstrated that AC depends on exercise type, involved muscle group [Bangsbo et al. 1990]. Both anaerobic power (AP) and AC must be excellent allowing competitors to repeat high intensity bouts of activity with minimal rest period such in combat sports. In these contact sports, high fitness level requires complex skills and tactical excellence for success, however, one very important component to success is to perform powerful and fast blows, which depend significantly of AP and AC.

Martial arts (e.g., karate, taekwondo, kickboxing) have specific psychophysiological demands [Alesi et al. 2014;Padulo et al. 2014] and requires well-developed muscle power in both the upper and lower limbs [Tabben et al. 2013]. These sport characteristics demonstrate the importance of anaerobic fitness development via AP and AC to achieve high fitness level. Among these aspects of fitness, muscle strength of the lower limbs is particularly important because it is crucial for kicking. To measure the anaerobic metabolism in lower limbs, researchers of the Wingate institution developed the Wingate test (WAnT) in cycle ergometer as a method of measuring maximal anaerobic power (peak and mean), as well as anaerobic fatigue. However, procedures of WAnT evaluate the mechanical outcomes (i.e., mechanical power, jumping performance) representing an estimation of anaerobic power instead of measurements of metabolic variables that represents the anaerobic capacity [Minahan, Chia, and Inbar 2007].

Recently, several studies have reported the possibility to estimate separately the oxygen equivalents from phosphagen and glycolytic energetic pathways during running and cycling using the fast component of excess post-exercise oxygen consumption (EPOCfast) and net blood lactate accumulation ($\Delta_{[La]}$) respectively [Zagatto et al. 2016a]. Bertuzzi et al. [2010] and Miyagi et al.

[2017], reported that the sum of both correspond to the AC predicted level. This procedure may help to estimate separately each metabolism and its relevance using specific exercise [Zagatto et al. 2016b]. This method could be also used to estimate the anaerobic capacity in combat sports such karate in association with short and briefs efforts such as jumping or pedalling (i.e. Wingate test). It is almost important to mention that efforts to develop and exploit valid testing design and procedures are seriously hampered by a significant and continuing lack of basic scientific knowledge concerning the AC and AP in combat sport such as karate and especially in children fighters. In fact, immaturity of anaerobic metabolism in this population is a major concern, and there are several possible reasons for a lower glycolytic activity compared with adult. As such, the aim of this study was to determine the test–retest reliability and concurrent validity of the continuous jump test performed over 30s (CJ30s) for anaerobic capacity evaluation of children athletes in kicking combat sports, using WAnT as a reference tool. To the best of our knowledge, this study is the first attempt to determine the anaerobic capacity and power by jump test due to increased activity of lower limbs during the fight; then, we aimed to improve the ecological validity compared to cycling Wingate test.

MATERIALS AND METHODS

Participants

Thirteen children female karateka (Age:11.07±1.32 years; body weight: 41.76±15.32 kg; body height: 152±11.52 cm; training experience: 4.38±2.14 years) volunteered to participate in this study. The parents reviewed and signed consent forms approved by the local Ethics Committee for Human Research (ECHR) of the University of Split: “Ethical Committee of the Faculty of Kinesiology (ECFK)”. The “Ethical Committee of the Faculty of Kinesiology” approved the entire study design which has been conducted according to the principles expressed in the Declaration of Helsinki. Participants trained on a regular basis (three sessions per week) during 2 years and they were currently competing at the national level. Inclusion criteria included the absence of the following: contraindications to maximal exercise testing (e.g., cardiovascular or pulmonary disease); metabolic syndrome symptoms (e.g., hypertension, impaired fasting glucose), joint & muscle injuries.

Experimental Procedures

Participant were tested in three separate sessions with an interval of 48-h between each session. The first and second sessions were used to determine the reliability of the Continuous Jump test (CJ30s), while the third session was used to perform Wingate Anaerobic Test (WAnT) that was considered as standard test to investigate concurrent validity.

Anthropometric measurements were performed during the first session. Participants were familiarized with testing procedures to negate learning effect. Participants avoided physical activity during the 48 h preceding each test. Participants were asked to abstain from high glycemic loads, saturated and trans-fatty acids, caffeine, alcohol, drugs, vitamins or supplements, and low-fiber diets for the duration of the study. All tests were performed in the morning 2h postprandial and under same condition (temperature: ~24°C inside laboratory) to avoid any circadian effect [Ammar et al. 2015]. During the tests the participants remained 10-min sitting in a chair to measure the resting blood lactate value (baseline), as well as after the tests the same procedures was adopted (i.e., 10-min of resting) to measure the blood lactate response and mainly the fast component of excess post-exercise oxygen consumption (EPOC-fast).

CJ_{30} testing

The CJ30s was preceded by five joint mobility exercises (one set of 10-s) with emphasis on the lower limbs and 2 jumps with 1-min in-between. The CJ30s consisted of maximal continuous vertical jumps performed for 30s in according to Dal Pupo et al. [2014]. Participants were required to keep the trunk as vertical as possible, and hands were placed on hips. According to recommendations of the protocol, participant was also asked to flex their knees at ~90° in the transition between negative/positive phases [Padulo et al. 2013], which is considered the best angular position to maximize the vertical jump performance [Gheller et al. 2015]. To better replicate each jump (i.e. braking phase corresponding at knee 90°, ~5° as tolerance [Gheller et al. 2015]; previously standardized 90° with goniometer/accelerometer) an electronic "Bip" audio feedback (SpinItalia, Roma) via computer was used when each participant reached the knee at 90°. The electronic audio feedback [Vando et al. 2014] includes a customized accelerometer with sample rate 100-Hz (SpinItalia, Roma), secured by elastic band (Wetrap) on the rectus femoris (in the middle), connected via Bluetooth to the Notebook and managed from Bridge software (LagalaColli_Bridge V. 8.4.14.5). Verbal feedback will be provided to the subject during the test to encourage them to maintain maximum performance (i.e., explosive continuous jump) until the end of the test. All jumps was assessed with OptojumpNext (Microgate, Italy) [Attia et al. 2017].

The maximal jump height (H_{MAX}), the mean jump height of the first four jumps (H_{MEAN_4J}), the mean jump height of all jumps (H_{MEAN}) and the fatigue index were calculated. The fatigue index was obtained considering the first (H_{MEAN_4J}) and the last (H_{MEAN_end4J}) four jumps of the test [Maud and Foster 2009], according to Eq:

$$Fatigue\ Index = [(H_{MEAN\_4J} - H_{MEAN\_end4J})/H_{MEAN\_4J}]\times 100$$

The H_{MEAN_4J} was used as indicator of peak power in an attempt to determine an analogous measure in the CJ30s. This is similar to WAnT and is generally obtained during the first 5^{th} seconds of the test.

Wingate anaerobic test (WAnT)

Wingate anaerobic test (WAnT) was performed with a specific cycle-ergometer (Monarch, Peak Bike 894e, MONARK, Sweden), according to the protocol used by Inbar et al. [1996]. Participants were adjusted on cyclo-ergometer (the seat higher in relationship of the length leg and the distance of the handlebar [Padulo, Di Capua, and Viggiano 2012;Padulo et al. 2015]) and performed a warm-up of 5-min in the cycle ergometer with a load of 35W. A maximal sprint between 3 and 5-s was performed at the end of each minute. The test started 2-min after the warm-up. WAnT was performed at maximal intensity for 30-s with a load corresponding to 7.5% of body mass (previously calculated). Resistance was applied after 3-s and the revolution per minute reached almost 70 of maximal acceleration with no load. Participants were instructed to remain seated throughout the test and received verbal encouragement to sustain their maximum effort throughout the test. A one-minute period of cycling with no load was included at the end of the test. The following variables were obtained in WAnT with the Monark Software (Monark ATS Software, MONARK, Sweden): Peak power, mean power, lowest power and fatigue index [Maud and Foster 2009] calculated according to Eq. :

$$\textit{Fatigue Index} = [(\text{Peak power - lowest power})/\text{Peak power}] \times 100$$

Physiological and Metabolic measurements

Arterialised blood samples (20 ul) were collected from the earlobe at rest and after and after (1^{st}, 3^{th} and 5^{th} minutes of recovery) WAnT and CJ30s respectively. Lactate concentration was determined through a portable lactate scout Lactate Pro LT-17 (ArkRay Inc. Kyoto, Japan), which was calibrated before each measurement according to the manufacturer's manual. The highest blood lactate concentration measured after the test was assumed as peak value and the net blood lactate concentration ($\Delta_{[La]}$) was determined by the difference between peak and baseline values.

The oxygen uptake (VO_2) and carbon dioxide production were measured and recorded breath-by-breath (Figure 1) using a metabolimeter system (K5, Cosmed, Italy) for the duration of the test (i.e. 10' at baseline – warm-up – 30s exercise – 15 minutes at rest). Before each test, the gas analyzer was calibrated using a high-precision gas mixture (5.06% CO_2 and 16.02% O_2) and the spirometer with a 3-liter syringe (Hans Rudolf, Kansas City, Missouri, USA), in accordance with the manufacturer's instructions. During the calibration process the gas analyzer was fixed on a pedestal to avoid any influence of the external load (i.e. metabolimeter's weight) during the jumps or pedaling; while the Omnia software (Cosmed, Italy) was able to discriminate with markers each phase. Energetic contributions from phosphagen (E_{PCr}) and glycolysis ($E_{[La]}$) were estimated during both tests (CJ30s and WAnT). The E_{PCr} contribution was considered as the $EPOC_{fast}$, which was estimated by multiplication of the amplitude and the time constant of the fast component of a bi-exponential model, while the $E_{[La]}$ energy was estimated by $\Delta_{[La]}$, considering a value of 1 $mmol \cdot L^{-1}$ to be equivalent to 3 mL O_2/kg body mass [di Prampero and Ferretti 1999]. Both energetic pathways were calculated using the the GEDAE-LaB software by Bertuzzi et al. [2016]. Finally, the anaerobic capacity corresponded sum of both E_{PCr} and $E_{[La]}$.

STATISTICAL ANALYSIS

The data are expressed as mean and standard deviation (SD). The test–retest reliability was determined by calculating the intra-class correlation coefficient (ICC). The ICC values were classified as follows: <0.4 = poor reliability; 0.4–0.75 = fair to good reliability; and >0.75 = excellent reliability [Fleiss 1991]. Pearson's correlation coefficients were used to establish the correlation between WAnT and CJ30s parameters. Considering the strong reliability of test–retest previously analyzed, the retest data were randomly selected to compare with WAnT parameters. The following criteria were adopted for interpreting the magnitude of correlation between variables: <0.1, trivial; 0.11–0.3, small; 0.31–0.5, moderate; 0.51–0.7, large; 0.71–0.9, very large; and 0.91–1.0, almost perfect [Hopkins et al. 2009]. The analyses were performed with the Statistical Package for Social Sciences (SPSS Inc. v.17.0, Chicago, USA) and MedCalc® (v.11, USA) and the level of significance was fixed with P<0.05.

RESULTS

Table 1 shows the test and retest values of the CJ30s and WAnT parameters. No significant difference were found and the H_{MAX}, H_{MEAN} , fatigue index, blood lactate response and E_{PCr} presented ICC ranging from good to excellent while the fatigue index, $\Delta_{[La]}$, $E_{[La]}$ and anaerobic capacity presented ICC ranging fair to good reliability. These results demonstrated that both mechanical variables (jump performance) as well as anaerobic capacities were reliable.

In WAnT, the values obtained were: peak power = 5.41±1.26 W·kg^{-1}; mean power = 3.92±0.95 W·kg^{-1}; fatigue index = 57.70±13.52%; lactate peak = 6.77±2.25 mmol·L^{-1}, and anaerobic capacity = 2.05±0.74 LO_2. The E_{PCr} and $E_{[La]}$ estimated during WAnT were 1.41±0.50 and 0.84±0.61. LO_2. Large correlations were found between anaerobic capacity of CJ30s and WAnT (r= 0.730, P= 0.003; Figure 2), the blood lactate between CJ30s and WAnT found (r=

0.713, *P*= 0.009), demonstrating the concurrent validity. In addition, moderate correlations of fatigue index between CJ30s and WAnT (*r*= 0.640, *P*= 0.014), the mean height of the first four jumps of CJ30s and the WAnT's peak power (*r*= 0.572, *P*= 0.032), the mean vertical jump height of CJ30s and the mean power of WAnT (*r*= 0.589, *P*= 0.021) were found. In addition, The E_{PCr} measured during CJ30S and WAnT was significantly correlated (r=0.645 with p=0.0127), as well as the $E_{[La]}$ (r=0.807 with *P*=0.0005) respectively (Figure 3).

DISCUSSION

The main findings of the current study were the validation of reliability of anaerobic capacity measured during CJ30s and the significant and large correlation between anaerobic capacity estimated during CJ30s and Wingate test reporting the concurrent validity. In addition, we found interesting significant correlation between E_{PCR} and $E_{[La]}$ measured during both tests. Moreover, we found moderate and significant correlations between CJ30s and Wingate test for mechanical outcomes.

It is well demonstrated that prepubertal children have reduced activity of phosphofructokinase-1 and lactate dehydrogenase enzymes markedly observed during intense efforts [Ratel et al. 2002]. In fact, Hebestreit et al. [1996] found that during a maximal 30-s all-out effort the blood lactate concentration was 5.7 $mmol \cdot L^{-1}$ in prepubertal boys compared to 14.2 $mmol \cdot L^{-1}$ in adults. Similar results were also found in the current study. In fact, the peak blood lactate values were 5.76±2.03 to 6.02±1.58 for both CJ30s tests and 6.77±2.25 $mmol \cdot L^{-1}$ for WAnT. Such results could also explain the lower glycolytic capacity and the immaturity of anaerobic metabolism in children.

As we know, the anaerobic capacity represents the maximal amount of energy that can be resynthesized during a specific exercise and for isolate muscle grouping and for a specific period of time [Bangsbo et al. 1990]. Therefore, determination of the anaerobic capacity is more dependent of each exercise mode (i.e. CJ30s vs. WAnT). The anaerobic capacity estimated using the net blood lactate concentration and the fast component of EPOC was validated initially by Bertuzzi et al. [2010] for cycler ergometer and afterward reinforced by Miyagi et al [2017] for cycling and for Zagatto et al. [2016a] for treadmill running, reporting similar findings to maximal accumulated oxygen deficit. In addition, this procedure was widely reliable [Zagatto et al. 2017b], sensitive to distinguish individuals with different training status [Zagatto et al. 2017b], significantly correlated with running performance [Zagatto et al. 2017a] and sensitive enough to detect alterations in glycolytic metabolism responses following buffer supplement ingestion [Brisola et al. 2015].

Hence, the lower glycolytic capacity in prepubertal children can explain the lower anaerobic capacity reported in this study (1.77±0.88 during CJ30s and 2.05±0.74 LO_2 during Wingate test) compared to adults (i.e., ~3.6 to 4.0 LO_2 [Miyagi et al. 2017]).

It is important to recognize the limitations of the immature musculoskeletal system, which is structurally different than the mature system of adult and young individuals. The maximal anaerobic power exerted by muscle on force-velocity testing is then low.

The WAnT was widely used for anaerobic power testing in combat sports. Quergui et al [2014] observed a peak power ranging 9.8 W·kg^{-1} and the mean power ranging to 10.3 and 6.5 to 7.2 W·kg^{-1} during WAnT in kickboxing athletes. In the current study, the peak power was 5.41±1.26 W·kg^{-1} while the mean power corresponded to 3.92±0.95 W·kg^{-1}, which were lower than in kickboxing athletes, even in karateka's that have the kick as a matters determinant during the fight.

High-level kickboxing performance requires high neuromuscular activation of lower limbs [Tabben et al. 2014]. Phosphagens thus act as energy-storage molecules and are especially useful during brief and short muscular activity such as actions in Karate sport [Doria et al. 2009]. Therefore, the estimation of E_{PCr} during jump test and during WAnT is an effective method that will deliver athletes with best knowledge of their own abilities during maximal efforts.

Interestingly, the current findings showed significant correlation between E_{PCr} from CJ30s and WAnT (r=0.645). This result demonstrates the possibility to estimate the phosphagen energy system using jumps. In addition, the E_{PCr} values reported in the current study (1.10±0.43 and 1.33±0.40 LO_2 during CJ30s and Wingate test respectively) are similar to those found in adult sedentary individuals (~ 1.4 LO_2), slight lowers than moderately trained runners (~ 1.4 LO_2), but that were estimated in treadmill running [Zagatto et al. 2017b].

Despite of importance of anaerobic metabolism to karate, few information concerning to this topic is found in the literature, mainly about the phosphagen energy system. In this way, when some information is found, mainly about other combat sports, in general are reported the capacity of mechanical power instead some information about the bioenergetical metabolism. This study advances in the literature in this matter, bring a valid procedure to estimate the anaerobic capacity and anaerobic power, as well as to estimate the energetic contribution from phosphagen and glycolytic energy systems in a simple and ease effort, jumping, instead of only to measure the peak and mean mechanical power. This point is very relevant due the anaerobic power does not represent anaerobic capacity and vice-versa [Andrade et al. 2015;Minahan, Chia, and Inbar 2007]. In addition, despite of the Wingate test to be a excellent procedure to measure the mechanical anaerobic power for lower limbs, the effort performed during Wingate test does not mimic the effort events performed during karate, and therefore, to use jumps test seems more adequate. We recommend that in future study need to investigate the relationship between anaerobic capacity and power, as well as each energetic metabolism with karate performance, possibility using the ranking performance within a player category. In fact, this information could elucidate if the anaerobic metabolism is also relevant to performance in children such it is relevant for adult athletes.

CONCLUSIONS

A 30s continuous jumps test may be more practical tests compared with other longer tests (e.g., 60-s) with an improved validity and reliability. It is a specific exercise test for kicking combat sports which involve anaerobic alactic power, explosive power expressed in the stretch-shortening cycle movements. In addition, the use of a simple variable, i.e., jump height, rather than mechanical power has greater practical application and/or clinical relevance for coaches and physical trainers in combat sports. Because of its simple instrumentation, the CJ30s test is more easy than other methods of anaerobic power/capacity assessment performed in the area of kicking combat sports

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Table 1. Reliability measures of the anaerobic capacity, maximum height, mean height, fatigue index and blood lactate peak between test–retest sessions of the continuous jump test.

Variable	**Mean ± SD**		**ICC**	**CI (95%)**
	Test	Retest		
H_{MAX} (cm)	18.58±2.64	18.74±2.44	0.884	0.662-0.965
H_{MEAN} (cm)	13.63±1.63	13.79±1.55	0.742	0.341-0.917
FI (%)	31.82±17.10	32.48±12.02	0.657	0.186-0.886
$[La]_{peak}$	5.76±2.03	6.02±1.58	0.522	0.033-0.809
$\Delta_{[La]}$(mmol L^{-1})	4.18±1.66	4.66±1.64	0.653	-0.092-0.893
E_{PCr} (LO_2)	1.15±0.48	1.10±0.41	0.588	0.128-0.840
$E_{[La]}$ (LO_2)	0.63±0.44	0.67±0.46	0.828	0.565-0.939

H_{MAX} = maximal jump height; H_{MEAN} = mean height considering all jumps; FI = fatigue index; LAC_{PEAK} = blood lactate peak; E_{PCr} = Anaerobic Alactic; $E_{[La]}$ = Anaerobic Lactic; ICC= Intra-class Correlation Coefficient; CI= confidence interval.

Figure Capture

Figure 1

Oxygen uptake pre, during and post a Wingate anaerobic test (WanT) and CJ30 (30s continuous jumps test)

Figure 2

Anaerobic Capacity (LO2) relationship between the Wingate anaerobic test (WanT) and CJ30 (30s continuous jumps test)

Figure 3

Anaerobic Capacity (LO2)relationship between (E_{PCr}=A and $E_{[La]}$=B) the Wingate anaerobic test (WanT) and CJ30 (30s continuous jumps test)

Figure 1.JPEG

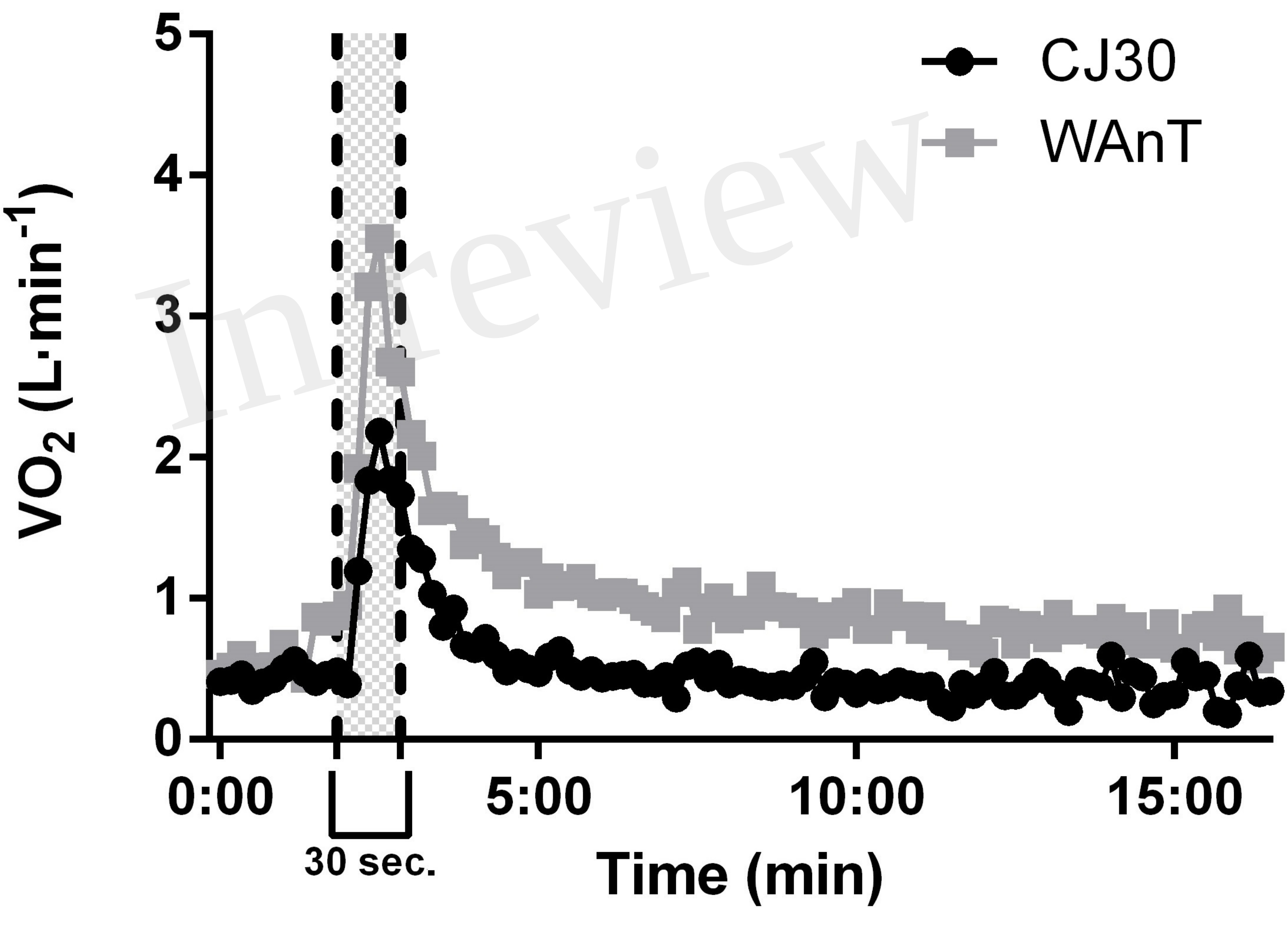
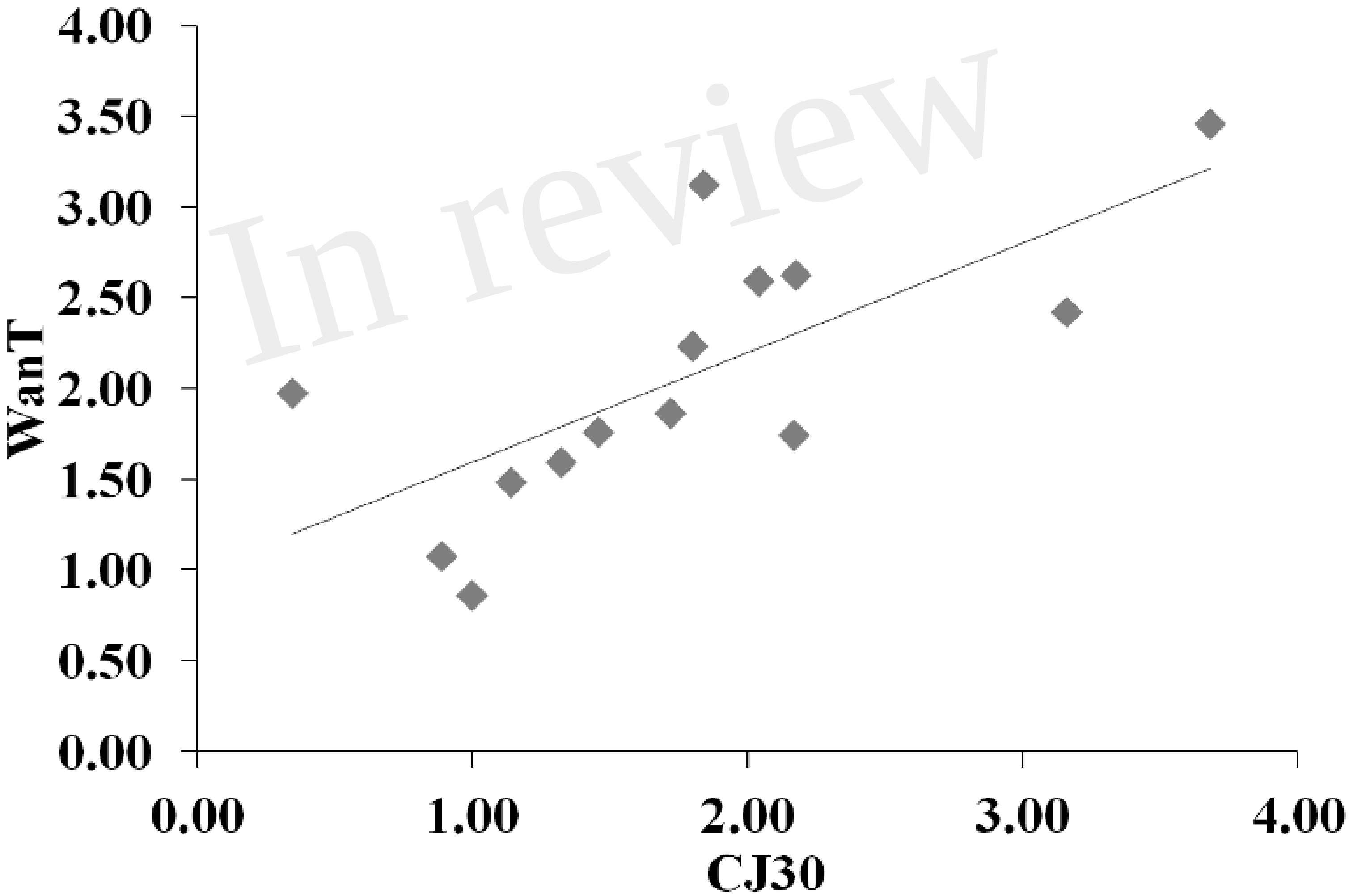
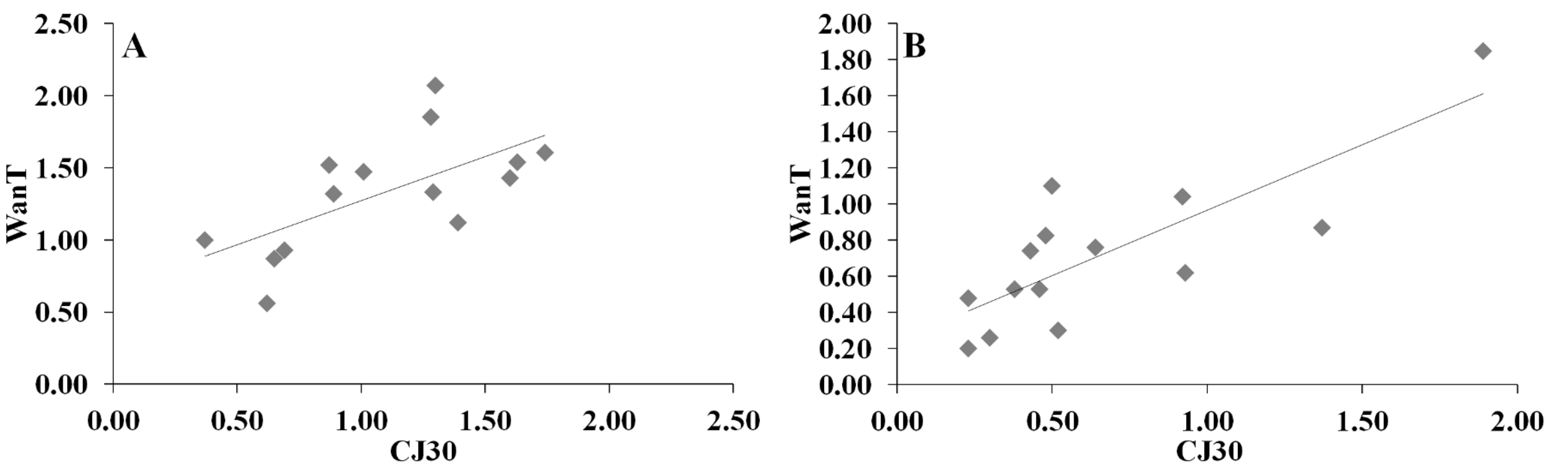


Figure 2.TIF



4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
WanT
0.00
1.00
2.00
3.00
4.00
CJ30

Figure 3.TIF


A
2.50
2.00
1.50
1.00
0.50
0.00
WanT
0.00
0.50
1.00
1.50
2.00
2.50
CJ30
B
2.00
1.80
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
WanT
0.00
0.50
1.00
1.50
2.00
CJ30