



## ❖ PHYSICAL EDUCATION AND SPORT

**EFFECTS OF MENTHA PIPERITA INHALATION ON SOME FACTORS OF PHYSICAL AND MOVEMENT PERFORMANCE OF MALE ATHLETES STUDENTS****ASGAR SHAHR.ESFANGREH<sup>1</sup>, MOHAMMAD ALI AZARBAIJANI<sup>2</sup>, BAHLOUL HABIBI<sup>3</sup>**<sup>1</sup>Islamic Azad university of Ahar, IRAN<sup>2</sup>Islamic Azad University of central Tehran, IRAN<sup>3</sup>Pharmaceutics collage, Tabriz University of Medical Science, IRAN

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**Abstract**

Current research performed on male athlete students of Tabriz university with average age of (23/30±3/492) average weight of (71/15±9/005 kg) Average height (175/25±1/949cm). In order to examine the effect of Mentha piperita inhalation on some factors of physical and movement performance of these students. 20 male students voluntarily participated in the study. First, reaction time, strength of back muscles and sit-up tests performed upon participants, Respectively, and then Bruce test was inducted, separately. Regarding the Maximum amount of consumed oxygen obtained from Bruce test results participants divided into two groups of 10 (Experimental and control). Participants of experimental group inhaled the peppermint (pumped in experiment room) in which the 2 ml of pumped peppermint mixed with white alcohol in area of 35m<sup>2</sup>, temperature of 28 c and humidity of 45-55% and used in strength of back and abdominal muscles and reaction time tests and then two drops of peppermint odor examined for the tests. Similar tests were performed on control group too, but the only difference was that peppermint replaced with white alcohol. T.test analysis used in whether results were meaningful or not current. Results suggest that there is a meaningful relationship between the administration of Mentha Piperita with aerobic performance ( $p \leq 0.01$ ) and reaction time ( $p \leq 0.05$ )

**Key words:** Maximum aerobic performance, Reaction time, Abdominal muscle resistance, Back muscle strength, Male athlete, Mentha piperita

**Introduction**

Good nutrition and use of allowed steroids are among factors affecting individual function and efficiency. For example, use of Creatine, carbohydrate and Na<sub>2</sub>CO<sub>3</sub> supplements enhances functions of speed athletes (A. Habibinia, 2001) or use of HMB supplement (1/5 to 3g/daily) increases strength in non-athlete men and women (H.W. Ludvigson, T.R. Rottman, 1989). However, Kerkick suggested that administration of the combined supplements (creatine, l.carnitin, Q10 coenzyme and colostrum) has increased effect on chest press power in strength exercises (Y.T. Millot, et. al., 2002). In order to improve the endurance, power, speed and strength, some athletes use steroids drugs and compounds which may cause health problems and side effects in athletes. Recent studies on herbal odors suggested that these compounds have various effects on mental and physical abilities (B. Raudenbush). According to psychological tests of Ludvigson and Rottman, Lavender affects the mood and increases one's alertness and freshness. (M.L. Pollock, et al., 1984)

Atheroleum as a natural Ergogenic Aid can be used to increase function and performance (V.S. Toller, 1998). Obvious effects on essentials is stimulation of olfactory. Odors greatly affect our feelings and also directly affect the brain. Olfactory system connected to Limbic system which is the control center of excitement, memory and sexual desires and also

involves in the control of heart beat, blood pressure, stress, respiration and hormonal balance. After topical administration or inhalation, these essentials are absorbed in the blood and affect the body. (G.S. Velague, 1987)

Peppermint with its major material, menthol (50%), contains other compounds such as Methyl ester (20%), Menthon (12%), bitter odors and Theanine (G. Burton, 1993; J.A., Duke, 1985).

Efficient materials of these herbs are used in relaxation of Neural System and treatment of respiratory disorders. (B.J. Gardner, A. Teddy, 1997)

In addition to Antibacterial properties, these herbs are useful in treatment of headaches, decreasing excitement and stress and respiratory problems. (E.J. Sawyer, 1991)

Peppermint is among drug stimulants, so it stimulates and accelerates the activities of body systems. It also contains Volatile materials which is discharged through respiratory system and stimulates the mucus and facilitates the mucus function and its discharge facilitates. Recent studies also suggest that these compounds have various effects on individual functions. Several studies reported the positive effects and ergogenic Aids along with increased efficiency of athlete associated with the use these compounds (M.H. Naimi, 2001) for example it is reported that inhalation of peppermint odor would be on stimulant to increase the energy of athletes and non-athletes during exercise.

(C., KERKSICK, et al. 2001) or in another study, it is reported that inhalation of peppermint essence while exercising, increases athletes function. However, few evidence exists to support or deny these results. Inhalation of peppermint may be efficient in increasing athletes performance and functions.

### Methods

Since the current research examines the scientific relations, so it is considered as an empirical research. But all influential factors on dependent variable are not controlled, so it can also be considered as a semi-empirical research. Here the objective is to examine the peppermint effects along with placebo effects, so the design used in the research would pre-test and post-test the control group. Descriptive statistics is used for classification and arrangement of data. Also, comparing the obtained results from experimental and control groups in pre and post –test, T-test used for dependent groups and T-test statistical used to indicate that whether results were meaningful.

### Sample analysis

Among statistical community, 20 Athlete students of Tabriz University who took part in Championship plays of Iran students 2004-2005 were selected.

After measurements, average height (175/25+1/949cm), weight (71/15+9/00kg), age (22/30+3/492) determined. No participant had any experience of physical problems and was not under medications.

### Results

After comparing pretest (Vo2 max), reaction time, back muscle and abdominal muscle strength of experimental and control groups, it was determined

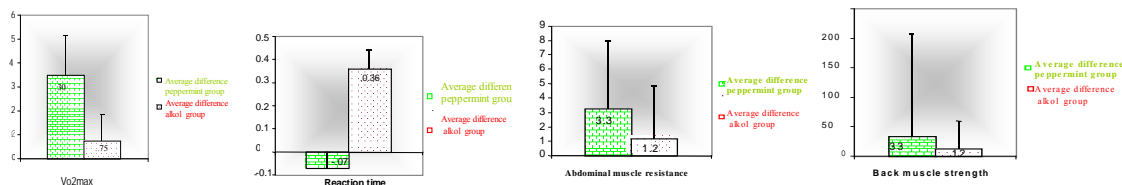
that there was no meaningful relationship between the two pre-tests. On the other hand, after ranking process, it is determined that samples are selected from particular community which have similar variance and average. In fact, the homogenous presumption of variances is confirmed.

1) Comparing the average difference of pre-test and post-test of (vo2max) in two groups. There was no meaningful relationship between average difference of control and experimental groups. ( $\alpha \leq 0/001$ ). On the other hand, inhalation of peppermint odor had meaningful effect on aerobic performance.

2) Comparing the average difference of pretest and post-test of reaction time in the 2 groups. And also considering the obtained t and  $\alpha \leq 0/005$ , there was a meaningful difference between control and experimental groups. i.e, inhalation of peppermint odor has meaningful effects on reaction time of athlete males of Tabriz University.

3) Comparing the average difference of pre-test and post-test of abdominal muscle resistance in 2 groups), it was determined that considering the obtained t and  $\alpha \leq 0/275$ , there is no meaningful difference between control and experimental groups. i.e, inhalation of peppermint odor has no meaningful effect on the resistance of abdominal muscle.

4) Comparing the average difference of pre-test and post-test of back muscle strength in 2 groups and considering the obtained t and  $\alpha \leq 0/318$ , there was no meaningful difference between control and experimental groups. i.e, inhalation of peppermint odor has no meaningful effect on the strength of back muscle of athlete males of Tabriz university.



### Discussion

Results of the current study, conforms with the findings of Barton & Goldberg (1993) and Reudenbasch & et.al (2001) who examined the effect: of inhalation of peppermint odor on the performance rate of athletes and non-athletes during exercise. (W.F. Simpson, et al., 2001, I. Savic, 2001), but is in contrast with the studies of Simon & et.al (2001) who examined the effect of aromatics on physical activities which probably is due to fewer participants in Simon & et.al research. In current research, inhalation of peppermint odor increased the aerobic performance of experimental group. According to calculations, the aerobic performance was 82% that considering the

standard range, the test is of acceptable performance (J.M. Ronald, 2001) and regarding peppermint functional mechanism which causes the expansion and relaxation of respiratory muscles in contraction state and also affects the opening of upper respiratory tracts and regulation of cardiopulmonary system, conforms with the current results. (W. Hay, 2000)

The results of the study conforms with findings of Reudenbasch and et.al (2001) who examined the effects of inhalation of aromatics of peppermint odor on athletes performance, but in contrast with findings of Mill at and et.al (2002) who examined the aromatics effects on reaction time (B. Raudenbush, et al., 2001). However, the results of the



study conforms with findings of Barton and Goldberg (1993) who examined the inhalation of peppermint odor on functional rate of athletes and non-athletes during exercise. Investigating the average pretest and post-test of reaction time, it is determined that average reaction time increased compared to pre-test and the result was statistically meaningful on the other hand, inhalation of 1mm of peppermint odor caused meaningful increase in reaction time of participants ( $p \leq 0/011$ ). However, comparing pre-test and post test, reaction time in control group increased, which indicates that inhalation of 2ml of white Alcohol wouldn't cause meaningful increase in reaction time of participants ( $p \leq 0/179$ ). However, decrease in reaction time of experimental group may be due to the effects of peppermint odors on neural system which these odors may cause relaxation and decreased stress and result in decreased heart beat during maximum activities.

In the current study, inhalation of peppermint odors increased the aerobic performance in experimental group. But the functional mechanism of these aromatics is uncertain. In the current study, based on available facilities, we performed the study to the current level.

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