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**ESSENTIAL OIL OF JUNIPERUS VIRGINIANA IN DIFFERENT
CONCENTRATION, ITS EFFECT ON PSYCHOEMOTIONAL STATE, MENTAL
CAPACITY AND HUMAN MEMORY**

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Introduction

Essential oil of *Juniperus Virginiana* L. (EOJV), by commercial name cedar oil, is used extensively in perfumery, though its pharmaceutical properties need further investigation. It's considered cedar oil possesses common sedative, relaxing and light hypnotic action [2]. EO of *Juniperus Virginiana* L. mostly consists of α - and β -cedrene, cedrol, tujopsene.

It was revealed essential oil with content of 1,0 mg/m³ influences on human mental capacity: velocity of information processing increases, a number of mistakes in simple and complex sensomotor reaction goes down [1].

Objective of this research is to study influence of *Juniperus Virginiana* L. EO in various content on human mental activity.

Objects and methods of the research

60 workers of locomotive shed in the 20-60 age range, divided into three groups of 20 people took place in this investigation. Control group was similar by number and membership group. Test people of the control group were being at rest listening to psychorelaxational record for 20 minutes. Test people of experimental groups were being at the same room during the same time listening to the same psychorelaxational record, but under influence of evaporating *Juniperus Virginiana* L. essential oil in various contents.

Content of EO volatile components in the air for the 1st group made: 0,5 mg/m³; 2nd group – 1,0 mg/m³; 3rd group – 2,0 mg/m³. Test was conducted before and after this procedure.

In assessment of EO influence on the nervous system it was used proofreading trial: "Landolt rings", WAM test (well-being activity, mood), Spielberg test, memory test using 10 words, simple complex sensomotor reactions [4, 5]. The data were processed using Student's t test for conjugate and independent sorting [3].

Results and discussion

According to dynamics of WAM test, EO of *Juniperus Virginiana* L. has a positive effect on psychoemotional state of test people in spite of its content (table 1).

General condition becomes better if the EO content makes 0,5 and 1,0 mg/m³, 2,0 mg/m³ keeps this tendency. Well-being improves under EO effect of all contents, mood level - 0,5 and 2,0 mg/m³. Psychological tension considerably relieves under EO influence of all contents.

Table 1

Influence of *Juniperus Virginiana* L. essential oil on psychoemotional human state. Contents 0,5-1,0-2,0 mg/m³ (parameters of WAM test, standard unit).

Parameter		Before procedure	After procedure	P b/a<
General condition	0,5 mg/m ³	133,50±6,14	149,20±4,18	0,001
	1,0 mg/m ³	140,54±5,06	151,27±4,73	0,02
	2,0 mg/m ³	133,10±6,82	147,30±6,56	0,06
	Control	137,50±3,68	137,85±4,37	>0,1
Well-being	0,5 mg/m ³	147,47±5,79	157,23±4,03	0,0006
	1,0 mg/m ³	142,29±6,40	156,56±5,13	0,008
	2,0 mg/m ³	147,95±8,04	163,04±7,12	0,05
	control	146,80±6,38	150,45±6,15	0,01
Mood	0,5 mg/m ³	150,96±5,34	157,34±3,78	0,02
	1,0 mg/m ³	147,18±4,95	151,01±5,03	>0,1
	2,0 mg/m ³	149,05±7,04	161,70±6,10	0,02
	control	148,40±7,14	154,95±7,55	0,01
Tension– relief	0,5 mg/m ³	131,85±10,99	155,90±9,84	0,03
	1,0 mg/m ³	129,25±8,47	151,05±11,26	0,02
	2,0 mg/m ³	133,10±8,95	155,48±7,40	0,007
	Control	135,15±5,84	142,75±3,76	>0,1

Juniperus Virginiana L. essential oil of 1,0 and 2,0 mg/m³ contents decreased situational anxiety, though it didn't effect on personal anxiety (table 2).

Table 2

Influence of *Juniperus Virginiana* L. essential oil on general situational and personal anxiety (Spilberg test) Contents 0,5-1,0-2,0 mg/m³

Parameter		Before test	After test	P b/a<
Situational anxiety, standard unit	0,5 mg/m ³	32,10±2,24	31,05±2,27	>0,1
	1,0 mg/m ³	33,30±1,86	29,50±1,97	0,05
	2,0 mg/m ³	34,10±2,83	29,95±1,83	0,02
	control	34,60±0,72	33,30±0,91	>0,1
Personal anxiety, standard unit	0,5 mg/m ³	34,85±1,51	34,05±1,70	>0,1
	1,0 mg/m ³	35,95±1,33	35,40±1,80	>0,1
	2,0 mg/m ³	38,95±2,42	36,80±2,56	>0,1
	Control	34,00±0,59	31,40±1,36	>0,1

Influence of *Juniperus Virginiana* L. essential oil on workability self-rating was insignificant (table 3). But attentiveness level became higher (EO content – 1,0 mg/m³).

Table 3

Influence of *Juniperus Virginiana* L. essential oil on human workability self-rating (parameters of WAM test, standard unit). EO content – 0,5-1,0-2,0 mg/m³.

Parameter		Before procedure	After procedure	P b/a<
Weakness-capacity to work	0,5 mg/m ³	140,04±9,05	134,68±9,27	>0,1
	1,0 mg/m ³	143,06±5,51	146,84±6,33	>0,1
	2,0 mg/m ³	139,95±9,38	146,50±8,31	>0,1
	Control	140,15±5,68	146,85±5,72	>0,1
Weakness-vivacity	0,5 mg/m ³	138,64±7,70	138,78±9,81	>0,1
	1,0 mg/m ³	144,25±9,20	157,35±8,53	>0,1
	2,0 mg/m ³	139,80±10,66	150,12± 9,49	>0,1
	control	142,30±7,62	149,60±7,24	>0,1
Absent-mindedness-attantiveness	0,5 mg/m ³	143,42±6,48	139,41±9,17	>0,1
	1,0 mg/m ³	146,80±5,53	165,35±6,66	0,0007
	2,0 mg/m ³	139,11±9,92	154,29±7,32	>0,1
	control	139,00±4,83	143,00±6,92	>0,1

Influence of *Juniperus Virginiana* L. essential oil on sensomotor reactions reveals under effect of minimal content (table 4)

As a result time of simple sesomotor reaction increases and a number of mistakes in complex sensomotor reaction decreases for tendency.

Under influence of essential oil with content 1,0 mg/m³, a number of mistakes in the simple sensomotor reaction goes down for certain.

Juniperus Virginiana L. essential oil with content 2,0 mg/m³ didn't result in changes sensomotor reactions.

Table 4

Influence of *Juniperus Virginiana* L. essential oil on time of simple (Tsimp) and complex (Tcomp) sensomotor reactions and their number of mistakes (Msimp and Mcomp accordingly). EO content – 0,5-1,0-2,0 mg/m³.

Parameter		Before procedure	After procedure	P
Tsimp, msec	0,5 mg/m ³	286,65±6,89	300,79±6,65	0,03
	1,0 mg/m ³	279,92±7,03	291,28±8,13	>0,
	2,0 mg/m ³	287,52±9,92	300,01±9,60	>0,
	control	297,28±2,89	296,35±5,80	>0,
Msimp, un its/test	0,5 mg/m ³	0,50±0,24	0,65±0,25	>0,
	1,0 mg/m ³	0,54±0,10	0,14± 0,05	0,00
	2,0 mg/m ³	0,56±0,18	0,32±0,10	>0,
	Control	0,55±0,15	0,70±0,23	>0,
Tcomp, msec	0,5 mg/m ³	363,34±10,80	375,14±10,27	>0,
	1,0 mg/m ³	349,88±12,66	350,96±9,57	>0,
	2,0 mg/m ³	357,74±14,12	365,38 ±10,54	>0,
	Control	362,83±1,87	363,80±9,67	>0,
Mcomp, units/test	0,5 mg/m ³	0,85±0,20	0,45±0,18	0,07
	1,0 mg/m ³	1,20±0,25	0,95±0,26	>0,
	2,0 mg/m ³	1,15±0,37	0,65±0,21	>0,
	Control	0,80± 0,14	0,85±0,18	>0,

Influence of *Juniperus Virginiana* L. essential oil on volume of processed information and velocity of information processing change under minimal EO content: there is a tendency for increasing of processed information volume and velocity of information processing (table 5).

Authentic increasing of information processing velocity keeps under content 1,0 mg/m³. But EO content of 2,0 mg/m³ removes this effect.

Table 5

**Influence of *Juniperus Virginiana* L. essential oil on general volume of processed information (GVPI) and processing information velocity (PIV) in correction (Landolt's rings)
EO content – 0,5-1,0-2,0 mg/m³.**

Parameter		Before procedure	After procedure	P b/a<
GVPI, bit	0,5 mg/m ³	137,46±8,17	149,50±3,29	0,08
	1,0 mg/m ³	143,30±4,17	149,15±3,06	>0,1
	2,0 mg/m ³	142,20±2,79	140,40±4,53	>0,1
	control	141,15±0,99	143,65±2,00	>0,1
PIV, bit/sec	0,5 mg/m ³	1,32±0,11	1,53±0,13	0,02
	1,0 mg/m ³	1,43±0,10	1,59±0,11	0,003
	2,0 mg/m ³	1,49±0,14	1,58±0,12	>0,1
	control	1,50±0,05	1,49±0,07	>0,1

Influence of *Juniperus Virginiana* L. essential oil on short-term visual memory was marked under low content: authentic decreasing of memorized words with EO 0,5 mg/m³ and tendency for its decreasing – 1,0 mg/m³ (table 6).

Table 6

**Influence of *Juniperus Virginiana* L. essential oil on short-term visual and aural memories (test 10 words, average number of memorized words).
EO content – 0,5-1,0-2,0 mg/m³.**

Parameter		Before procedure	After procedure	P b/a<
Short-term visual memory	0,5 mg/m ³	5,65±0,26	4,55±0,27	0,004
	1,0 mg/m ³	5,95±0,34	5,35±0,23	0,08
	2,0 mg/m ³	6,60±0,28	6,55±0,39	>0,1
	Control	5,95±0,09	5,60±0,35	>0,1
Short-term aural memory	0,5 mg/m ³	4,95±0,28	5,00±0,29	>0,1
	1,0 mg/m ³	5,25±0,42	4,75±0,29	>0,1
	2,0 mg/m ³	5,30±0,33	5,55±0,31	>0,1
	control	4,95±0,14	5,10±0,32	>0,1

Conclusions

1. Essential oil of *Juniperus Virginiana* L. in spite of its content, has an euphoric effect on human subjects and didn't influenced on their workability self-rating.
2. Under effect of this essential oil with 1,0 and 2,0 mg/m³ content situational anxiety decreased and didn't change its parameters under minimal EO content.
3. Acceleration of simple sensomotor reaction, less number of mistakes in simple and complex sensomotor reactions, increasing of volume and velocity of processing information revealed under EO effect of 0,5 and 1,0 mg/m³ content and weren't marked under EO content of 2,0 mg/m³.

4. Short-term visual memory impairment also became apparent under EO contents of 0,5 and 1,0 mg/m³ and it wasn't marked under EO content of 2,0 mg/m³.

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The article concerns influence of *Juniperus Virginiana* essential oil on psychoemotional state, mental activity and human memory depending on its content: 0,5; 1,0; 2,0 mg/m³. *Juniperus Virginiana* essential oil in all studied contents had an euphoric effect on people being tested, but it didn't influence on their workability self-rating; contents 1,0 и 2,0 mg/m³ decreased situational anxiety. Objective tests showed improvement of mental activity and short-term memory impairment with essential oil content 0,5 and 1,0 mg/m³, and a lack of effect with content 2,0 mg/m³.

Key words: *essential oil, Juniperus Virginiana L., psychoemotional state; mental activity, memory.*

SOUTHERN HORTICULTURE

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VARIABILITY OF APPLE FRUIT CHEMICAL COMPOSITION DURING STORAGE

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