

ISSN 2509-4327 (print)
ISSN 2510-4780 (online)



Deutscher Wissenschaftsherold German Science Herald

№ 3/2017

Die Zeitschrift „Deutscher Wissenschaftsherold“ ist eine Veröffentlichung mit dem Ziel ein breites Spektrum der Wissenschaft allgemeinverständlich darzustellen. Die Redaktionsleitung versteht sich als Vermittler zwischen Wissenschaftlern und Lesern. Durch die populärwissenschaftliche Bearbeitung wird es möglich unseren Lesern neue wissenschaftliche Leistungen am besten und vollständigsten zu vermitteln. Es werden Untersuchungen, Analysen, Vorlesungen, kurze Berichte und aktuelle Fragen der modernen Wissenschaft veröffentlicht.

Impressum

Deutscher Wissenschaftsherold – German Science Herald

Wissenschaftliche Zeitschrift

Herausgeber:

InterGING

Sonnenbrink 20

31789 Hameln, Germany

Inhaber: Marina Kisiliuk

Tel.: + 49 51519191533

Fax.: + 49 5151 919 2560

Email: info@dwherold.de

Internet: www.dwherold.de

Chefredakteur/Editor-in-chief:

Marina Kisiliuk

Korrektur:

O. Champela

Gestaltung:

N. Gavrilets

Auflage: № 3 2017 (August) – 23

Redaktionsschluss August, 2017

Erscheint vierteljährlich

Editorial office: InterGING

Sonnenbrink 20

31789 Hameln, Germany

Tel.: + 49 51519191533

Fax.: + 49 5151 919 2560

Email: info@dwherold.de

Deutscher Wissenschaftsherold - German Science Herald is an international, German/English language, peer-reviewed, quarterly published journal.

№ 3 2017

Passed in press in August 2017

Druck: WIRmachenDRUCK GmbH

Mühlbachstr. 7

71522 Backnang

Deutschland

Der Abdruck, auch auszugsweise, ist nur mit ausdrücklicher Genehmigung der InterGING gestattet. Die Meinung der Redaktion oder des Herausgebers kann mit der Meinung der Autoren nicht übereinstimmen. Verantwortung für die Inhalte übernehmen die Autoren des jeweiligen Artikels.

INDEXING: Google Scholar, WorldCat, InfoBase Index, Journal Index, Citefactor, International Scientific Indexing, JIFACTOR, Scientific Indexing Services, International Institute of Organized Research.



JIFACTOR



CiteFactor
Academic Scientific Journals



Scientific Indexing Services



INTERNATIONAL
Scientific Indexing



UNIVERSITAT DE BARCELONA

MIAR

<http://miar.ub.edu/issn/2509-4327>

© InterGING

© Deutscher Wissenschaftsherold – German Science Herald

REDAKTIONSKOLLEGIUM / INTERNATIONAL EDITORIAL BOARD:

Jurga Bernatoniene, Dr., Prof.
Physics Lithuania
jurgabernatoniene@yahoo.com

Arvidas Galdikas, Dr. habil., professor
Physics Lithuania,
arvidas.galdikas@ktu.lt

Kristina Ramanauskienė, Ph.dr., Prof.
Pharmacy, Lithuania
kristinaraman@gmail.com

Khpaliuk Alexander, Dr. med. habil., Prof.
Pharmakologie, Belarus
clinicfarm@bsmu.by

Arnold M. Gegechkori, Dr., full Prof.
Biology, Georgia
arngegechkori@yahoo.com

Omari Mukbaniani, Prof., DSc.
Chemistry, Georgia
omar.mukbaniani@tsu.ge

Teimuraz Lezhava, Prof.
Genetics, Georgia
teimuraz.lezhava@tsu.ge

Shota A. Samsoniya, Prof.
Chemistry, Georgia
shota.samsonia@tsu.ge

Mdzinarashvili Tamaz, DSc., Prof.
Biophysics, Georgia
tamaz.mdzinarashvili@tsu.ge

Aliaksandr V.Prokharau, MD, PhD, MSc Prof.
Oncology, Belarus
aprokharau@gmail.com

Pyrochkin V., MD, PhD, MSc Prof.
Theraphy, Belarus
wlad_cor@mail.ru

Golubev A.P., BD, Prof.
Ecology, Belarus
algiv@rambler.ru

Makarevich A., MD, PhD, Prof.
Theraphy, Belarus
makae@bsmu.by

Kanunnincova N., BD, Prof.
Physiology, Belarus
n.kanunnikova@grsu.by

Giedrius Vanagas, Prof.
Internal Medicine, Lithuania
Giedrius.Vanagas@lsmuni.lt

Armuntas Baginskas, Prof.
Neurofiziologija, Lithuania
Armuntas.Baginskas@lsmuni.lt

Ricardas Radisauskas, MD., Ph.D., Prof.
Cardiology, Lithuania
Ricardas.Radisauskas@lsmuni.lt

Meyramov Gabit, Prof.
Cytology and Histology, Kazakhstan
meyramow@mail.ru

Aisha Mohammed Abd al-salam Shahlol
Ph.D. in Medical Bacteriology, Libya
Ais.shahlol@sebhau.edu.ly

Edmundas Kadusevicius, MD, PharmD, PhD, Prof.
Pharmacology, Lithuania
Edmundas.Kadusevicius@lsmuni.lt

Ivo Grabchev, Prof., PhD.
Chemistry, Bulgaria
i.grabchev@chem.uni-sofia.bg
grabchev@mail.bg

Mariyana Ivanova Lyubenova, Prof., PhD.
Ecology, Bulgaria
ryann@abv.bg
ryana_1@yahoo.com

Tsvetanka Tsankova Marinova, MD, PhD, DMedSci,
Biologv. Bulgaria
tmarinova@yahoo.com

Evgueni D. Ananiev, Prof PhD,
Biology. Bulgaria
evgueni_ananiev@yahoo.com

Plamen G. Mitov, Prof., PhD.
Biology, Bulgaria
mitovplamen@gmail.com

Atanas Dimov Arnaudov, Ph.D.
Physiology, Bulgaria
arny87@yahoo.co.uk

Iliana Georgieva Velcheva, PhD,
Ecology, Bulgaria
anivel@abv.bg

Osman Demirhan, Prof.
Biology, Turkey
osdemir@cu.edu.tr

Jharna Ray, M. Sc., PhD, Prof.
Neurogenetics, India
Indijaharnaray@gmail.com

Marián Halás doc. RNDr, Ph.D.
Human geography, Czech
marian.halas@upol.cz

Ayfer Pazarbasi Prof.Dr.
Biology, Turkey
payfer@cu.edu.tr

Tusharkanti Ghosh Prof.
Physiology, India
tusharkantighosh53@yahoo.in

Khudaverdi Gambarov Gambarov, Prof.
Microbiology, Azerbaijan
khuda1949@mail.ru

Rovshan Ibrahimkhalil Khalilov, Prof.
Biophysics, Azerbaijan
hrovshan@hotmail.com

Svitlana Antonyuk, Dr.phil.
Stony Brook University, USA
Linguistics

Samuel M.Johnson, Prof.Dr.phil.
Theology, Wells, Maine, USA
djtjohnson@earthlink.net

Satanovsky Leon MD/PhD.
Perio-odontologie, Israel
satleonid@gmail.com

Lists of references are given according to the Vancouver style

Arzu Kaska,

Department of Science and Mathematics, Faculty of Education, Pamukkale University, Denizli, Turkey, akaska@pau.edu.tr

Nahide Deniz,

Ramazan Mammadov

Department of Biology, Faculty of Arts and Science, Pamukkale University, Denizli, Turkey

ANTIOXIDATIVE CAPACITIES AND PHENOLIC COMPOUNDS OF VARIOUS EXTRACTS OF *AUBRIETA DELTOIDEA*

Abstract This study was designed to examine the phenolic compounds and antioxidant capacities of various extracts (ethanol, acetone and water) of *Aubrieta deltoidea*. The antioxidant activities of these extracts were evaluated by phosphomolybdenum and reducing power methods. In addition, total phenolic, flavonoid and tannin contents were also determined. In phosphomolybdenum method, among the three different extracts of *A. deltoidea* evaluated, acetone extract ($52.76 \pm 0.57 \mu\text{g}/\text{mg}$), showed the highest activity. Ethanol extract showed the highest amount of power reducing activity ($0.137 \pm 0.005 \text{ mg}/\text{mL}$). The total phenolic and flavonoid content of *A. deltoidea* extracts ranged from 15.21 ± 2.29 to $58.08 \pm 8.10 \text{ mgGAE}/\text{g}$ and 27 ± 0.87 to $93.18 \pm 0.36 \text{ mg QEs}/\text{g}$ respectively. Total tannins content of *A. deltoidea* extracts varied from 2.20 ± 0.38 to $56.94 \pm 9.89 \text{ mgCE}/\text{g}$.

Key words: *Aubrieta deltoidea*, Phosphomolybdenum, Phenolic compounds, Antioxidant.

Introduction. Use of plants as medicines has been known for centuries. Nowadays plants are basic food source and a way to prevent illnesses especially in developing country for the vast majority of the world population (Pezzuto, 1997). Large number of plants has been investigated for their antioxidant properties since natural antioxidants are very effective to prevent the destructive processes caused by oxidative stress (Zengin et al., 2011). Brassicaceae family has number of biological active compounds such as phenolic acids, flavonoids and vitamins which are associated with antioxidant and anticancer properties. Therefore, Brassicaceae family possess both antioxidant and anticarcinogenic properties (Vaughn and Berhow, 2005; Cohen et al., 2000; Chu et al., 2002). *Aubrieta* genus, in the Brassicaceae family, consist of about 12 species (Al-Shehbaz et al., 2006) and genus *Aubrieta* comprises perennial herbs distributed in Southwest Asia (mostly Anatolia) and South and Southeast Europe. *Aubrieta deltoidea* is a species of flowering plant in the *Aubrieta* genus and it has an Anatolian-Balkan-Appennines area of distribution (Ancev and Goranova, 2009). Many papers have been published in which antioxidant properties and phenolic compounds of different plant species in Brassicaceae family especially

Brassica vegetables are studied but as far as our literature survey could ascertain, there are no reports on the biological activities of *Aubrieta deltoidea*. Therefore, the present study is the first in this area.

Objective. This study was designed to evaluate antioxidant properties, phenolic, flavonoid and tannin content of extracts isolated from *Aubrieta deltoidea* by different polarity solvents, such as ethanol, acetone and water.

Materials and methods: Plant material and plant extract. *A. deltoidea* was collected in the flowering stage from Honaz Mountain in Denizli (1300-1400 m) and identified in our laboratory. The aerial parts were air-dried and powdered. The extracts of *A. deltoidea* were prepared according to Ozay et al. (2015) and all extracts were lyophilized (Labconco FreeZone, Kansas City, MO) and stored at -20°C until use.

Determination of total antioxidant activity. Phosphomolybdenum method.

Antioxidant activities of acetone, ethanol and water extracts were evaluated by phosphomolybdenum method according to Prieto et al. (1999). In phosphomolybdenum method, different concentration of extracts (0.3 mL) were combined with 3 mL reagent solution (0.6 M sulfuric acid, 28 mM sodium phosphate and 4 mM

ammonium molybdate). The reaction mixture was placed in test tubes and the tubes were incubated at 95 °C for 90 min. Then the absorbance of the solution was measured at 695 nm against a blank.

Ferric reducing power methods. The reducing power activity carried out with slight modifications of the method of Oyaizu (1996). Different concentration of extracts were mixed with 0.2M phosphate buffer (pH:6.6) and 1% potassium ferricyanide. The mixture was incubated at 50°C for 20 min and then 10% trichloroacetic acid was added. Reaction mixture (2.5 mL) was mixed with 2.5 mL distilled water and 0.5 ml of 0.1% ferric chloride. The solution absorbance was measured at 700 nm.

Determination of bioactive components.
Tannin content. Tannin content was determined by the vanillin method of Bekir et. al. (2013) with slight modification. The extracts (0.5 mL) were mixed with vanillin reagent (1% in 7M H₂SO₄) in test tubes that are placed in an ice bath. Absorbance of the solution was measured at 500 nm after 15 min incubation at room temperature.

Total phenolic content. Total phenolic content was determined with Folin-Ciocalteu method (Slinkard and Singleton 1977). In this method, extract (1 mg/mL) was mixed with Folin-Ciocalteu reagent (1 mL) and distilled water (46 mL). After 3 min, 2% sodium carbonate (Na₂CO₃) solution was added. The mixture was incubated in dark for 2 h at room temperature and absorbance measured at 760 nm. Gallic acid was used for calibration and the results were expressed as mg of gallic acid equivalents (mg GAE g⁻¹ extract).

Total flavonoid content. Total flavonoid content of extracts was determined according to Arvouet-Grand et al. (1994). Briefly, 1mL of 2% AlCl₃ was mixed with the extract solution (2 mg/mL). After 10 min incubation at room temperature absorbance of the reaction mixtures were measured at 415 nm. The flavonoid content was calculated from a quercetin standard curve (mg QEs/g extract).

Statistical analysis. All analyses were performed in triplicate and The results obtained were analysed by using MINITAB Statistical Package program. The differences between the different extracts were tested with Analyses of Variance (ANOVA) and to see which groups are different from the others tested with Tukey

(P<0.05).

Results and discussion. Phosphomolybdenum and reducing power activity. There is no standard method for determining the antioxidant activity of a compound due to antioxidant activity determination methods depend upon several parameters such as the reaction condition in the system studied and the structure of the compound to be analyzed. Thus, it is recommended that the antioxidant measurements should be evaluated using a several methods, at least two methods (Brand-Williams et al., 1995; Zengin and Aktümsek, 2014). Consequently, we applied two antioxidant methods (phosphomolybdenum and reducing power method) to evaluate true antioxidant potential of the extracts. In this study, phosphomolybdenum activity of acetone, ethanol and water extract of *A. deltoidea* were 52.76 ± 0.57, 40.52 ± 4.37 and 34.40 ± 2.61 µg/mg respectively. There was a statistically significant difference between acetone, ethanol and water extracts (Table 1). The higher activity in acetone extracts were may due to high contents of antioxidant components. In previously studies phosphomolybdenum activity were determined from different species of Brassicaceae family (Ozay and Mammadov 2016; Savran et al., 2016). Savran et al. (2016) extracted *Pseudosempervivum sempervivum* using different solvents (acetone, metanol and water) and they found that phosphomolybdenum activity were found to be different according to the solvents used and this results were in aggrement with our results.

As can be seen from Table 1, the highest reducing power activity (0.137 ± 0.005 mg/mL) was observed in ethanol extract of *A. deltoidea* also the lowest reducing power activity (0.13 ± 0.003 mg/mL) was observed in water extract. In previously study, total reducing power activity was determined from *Zilla macroptera* of Brassicaceae family (Keffous et al., 2016). In compared results of this study and our study, reducing power activity of water extract of *A. deltoidea* is higher than water extract of *Z. macroptera*.

Total phenolic, flavonoid and tannin contents. Phenolic acids are phenolic compounds that have been extensively studied over the last years

Table 1
Antioxidative potentials of the extracts of *A. deltoidea*

Sample	Phospho- molybdenum ($\mu\text{g}/\text{mg}$)	Power reducing (mg/mL)
Acetone	52.76 ± 0.57^a	0.132 ± 0.004^{ab}
Ethanol	40.52 ± 4.37^b	0.137 ± 0.005^a
Water	34.40 ± 2.61^c	0.13 ± 0.003^b

*Values are mean of three replicate determinations ($n=3$) \pm standard deviation.

Mean values followed by different superscripts in a column are significantly different ($p<0.05$).

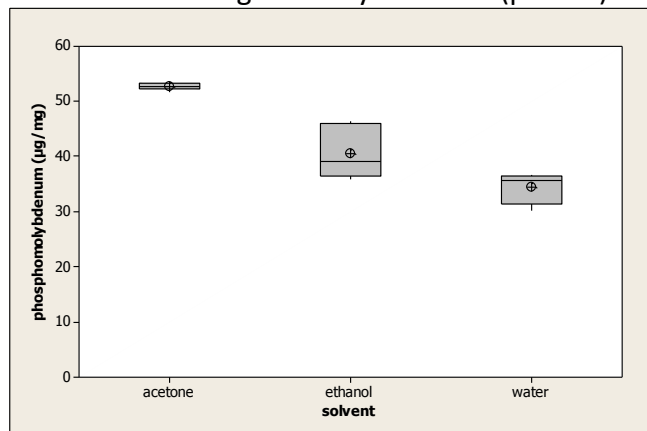


Figure 1. Comparison of phosphomolybdenum activity of different extracts of *A. deltoidea*

because of their potency in protecting against various diseases such as cancer, dermatological and coronary heart diseases. (Piasek et al., 2009; Mammadov 2014). Phenolic compounds are good indicators of antioxidant activity because of their hydrogen donor and radical scavenging properties (Miguel, 2010) and chelating ability (Michalak, 2006). In present study, total phenolic content of *A. deltoidea* extracts ranged from 15.21 ± 2.29 to 58.08 ± 8.10 mgGAE/g. Acetone extract contained the highest total phenolic content (58.08 ± 8.10 mgGAE/g) followed by ethanol extract (22.34 ± 2.22 mgGAE/g), and water extract (15.21 ± 2.29 mgGAE/g) (Table 2). Previous reports have demonstrated that water extracts from several plants possess lowest phenolic contents, which is in agreement the present results (Zengin et al., 2015, Savran et al., 2016).

Flavonoids are secondary metabolite that are abundant and commonly found in plant foods. Flavonoids also have significant antioxidant properties and they can act as free radical scavenger and metal chelators (Aktümsek et al.,

2013; Carocho and Ferreira, 2013). In the present study, acetone extract (93.18 ± 0.36 mgQEs/g) possessed highest content of flavonoid compared to ethanol and water extracts with 77.59 ± 1.29 and 27 ± 0.87 mg QEs/g respectively (Table 2). In previously studies total flavonoid content were determined from different species of Brassicaceae family (Ozay and Mammadov, 2016; Savran et al., 2016). Savran et al. (2016) indicated that total flavonoid content of acetone, metanol and water extracts of *Pseudosempervivum sempervivum* were 30.9 ± 0.6 , 41.5 ± 0.2 and 13.2 ± 0.4 mg QEs/g respectively. In compared results of this study and our study, flavonoid content of acetone and water extracts of *A. deltoidea* (93.18 ± 0.36 and 27 ± 0.87 mg QEs/g) are higher than acetone and water extracts of *P. sempervivum* and flavonoid contents were found to be different according to the solvents used.

In the present study, total tannins content of *A. deltoidea* extracts was presented in Table 2 and varied from 2.2 ± 0.38 to 56.94 ± 9.89 mgCE/g. Acetone extract contained the highest value of total tannins content (56.94 ± 9.89 mgCE/g) followed by ethanol (22.76 ± 4.26 mgCE/g), and water (2.20 ± 0.38 mgCE/g). There was a statistically significant difference between acetone, ethanol and water extracts (Table 2). Bekir et al., (2013) extracted *Punica granatum* using different solvents and they found that tannin contents were found to be different according to the solvents used. This was in agreement with our

Table 2.
Total flavonoid, phenolic and tannin content of *A. deltoidea* extracts

Sample	Total flavonoid content (mgQEs/g)	Total phenolic content (mgGAEs/g)	Total tannin content (mgCEs/g)
Acetone	93.18 ± 0.36^a	58.08 ± 8.10^a	56.94 ± 9.89^a
Ethanol	77.59 ± 1.29^b	22.34 ± 2.22^b	22.76 ± 4.26^b
Water	27 ± 0.87^c	15.21 ± 2.29^c	2.2 ± 0.38^c

*Values are mean of three replicate determinations ($n=3$) \pm standard deviation. Mean values followed by different superscripts in a column are significantly different ($p<0.05$).

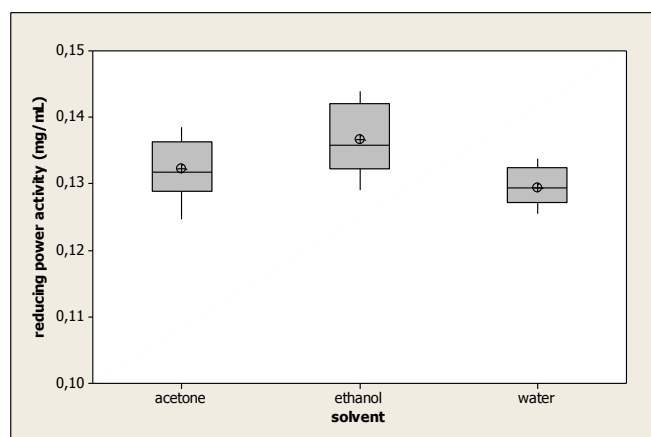


Figure 2. Comparison of reducing power activity of different extracts of *A. deltoidea*

results, tannin content varied according to the solvent used.

Conclusions. Interest in antioxidants have also increased considerably in recent years because the use of antioxidants is an effective way of protecting against free radical-related diseases (Babu et al., 2013). In the present study, antioxidant capacities, total phenolic, flavonoid and tannin content of ethanol, acetone and water extracts of *A. deltoidea* were evaluated. To the best of our knowledge, this study is the first undertaken on the antioxidant properties and phenolic compounds of *A. deltoidea*. We think that the results showed here will supply new information for further studies in this species.

Prospects of further studies. The results presented here will help us to understand the antioxidant capacity and phenolic compounds of *A. deltoidea* and might provide additional information for the further studies about evaluate biological activities of this species and also help us to understand the importance of *A. deltoidea*. However, further indepth studies, such as the study of additional antioxidant capacities, phenolic compound and also study of anthelmintic, antimicrobial activities are needed.

References:

1. Aktümsek A, Zengin G, Güler GO, Cakmak YS, Duran A. Antioxidant potentials and anticholinesterase activities of methanolic and aqueous extracts of three endemic *Centaurea L.* species. *Food and Chemical Toxicology*. 2013;55:290-6.
2. Al-Shehbaz IA, Belstein MA, Kellogg EA. Systematics and polyploidy of the Brassicaceae (Cruciferae): an overview. *Plant Systematics and Evolutions*. 2006;259:89-120.
3. Ančev M, Goranova V. Trichome morphology of eleven genera of the tribe Alysseae (Brassicaceae) occurring in Bulgaria. *Willdenowia*, 2006;36:193-204.
4. Arvouet-Grand A, Vennat B, Pourrat A, Legret P. Standardization of a propolis extract and identification of the main constituents. *Journal de pharmacie de Belgique*. 1994;49:462-8.
5. Babu D, Gurumurthy P, Borra SK, Cherian KM. Antioxidant and free radical scavenging activity of triphala determining by using different in vitro models. *Journal of Medicinal Plant Research*. 2013;39(7):2898-905.
6. Bekir J, Mars M, Souchard JP, Bouajila J. Assessment of antioxidant, anti-inflammatory, anti-cholinesterase and cytotoxic activities of pomegranate (*Punica granatum*) leaves. *Food and Chemical Toxicology*. 2013;55:470-5.
7. Brand-Williams W, Cuvelier ME, Berset C. Use of free radical method to evaluate antioxidant activity. *Lebensmittel Wissenschaft und Technologie*. 1995;28:25-30.
8. Carrocho M, Ferreira, I.C.F.R. A review on antioxidants, prooxidants and related controversy: natural and synthetic compounds, screening and analysis methodologies and future perspectives. *Food and Chemical Toxicology*. 2013;51: 15-25.
9. Cohen J, Kristal R, Stanford J. Fruit and vegetable intakes and prostate cancer. *Journal of the National Cancer Institute*. 2000;9:61-8.
10. Chu Y-F, Sun J, Wu X, Liu RH. Antioxidant and antiproliferative activities of common vegetables. *Journal of Agriculture and Food Chemistry*. 2002;50: 6910-6.
11. Keffous F, Nasser B, Houria D, Abdelkrim C, Khaled S, Hassan YA. Total antioxidant capacity, reducing and cyclic voltammetry of *Zilla macroptera* (Brassicaceae) aqueous extract. *Current bioactive compounds*. 2016;12(1):39-45.
12. Mammadov R. Fenolik bileşikler. *Tohumlu bitkilerde sekonder metabolitler*. Nobel Yayıncılık. 2014; p. 173-274.
13. Miguel M. Antioxidant activity of medicinal and aromatic plants. A review. *Flavour Fragr J*. 2010;25:291-312.
14. Oyaizu M. Studies on product on browning

reaction prepared from glucose amine. *Japanese Journal of Nutrition*. 1986;44:307-15.

15. Ozay C, Mammadov R, Tasdelen G, Karagur ER, Akça H. Potential antioxidant, antiproliferative and hepatoprotective effects of *Crataegus meyeri*. *Journal of Food Biochemistry*. 2015;39:548.

16. Ozay C, Mammadov R. Assessment of some biological activities of *Alyssum L.* known as madwort. *Natural Drugs*. 2016;5(73):1213-20.

17. Pezzuto JM. Plant derived anticancer agents. *Biochemical Pharmacology*, 1997;(2):121-133.

18. Piasek A, Bartoszek A, Namiesnik J. Phytochemicals that counteract the cardiotoxic side effects of cancer chemotherapy. *Postepy Hig Med Dosw*. 2009;63:142-58.

19. Prieto P, Pineda M, Aguilar M. Spectrophotometric quantitation of antioxidant capacity through the formation of a phosphomolybdenum complex: Specific application to the determination of vitamin E. *Analytical Biochemistry*. 1999;269:337-41.

20. Savran A, Zengin G, Aktümsek A, Mocan A, Glamoclija J, Ciric A, Sokovic M. Phenolic compounds and biological effects of edible *Rumex scutatus* and *Pseudodempervivum sempervivum*:

potential sources of natural agents with health benefits. *Food & Function*. 2016;7:3252.

21. Slinkard K, Singleton VL. Total phenol analyses: Automation and comparison with manual methods. *American Journal of Enology and Viticulture*. 1977;28:49–55.

22. Vaughn SF, Berhow MA. *Industrial Crops and Products*. 2005;21:193.

23. Zengin G, Cakmak YS, Guler GO, Aktümsek A. Antioxidant properties of methanolic extract and fatty acid composition of *Centaurea urvillei* DC. subsp. *hayekiana* Wagenitz. *Records of Natural Products*. 2011;(5):123-32.

24. Zengin G, Aktümsek A. Investigation of antioxidant potentials of solvent extracts from different anatomical parts of *Asphodeline anatolica* E. Tuzlaci an endemic plant to Turkey. *African Journal of Traditional, Complementary and Alternative Medicines*. 2014;11:481-8.

25. Zengin G, Uysa, S, Ceylan R, Aktümsek A. Phenolic constituent, antioxidative and tyrosinase inhibitory activity of *Ornithogalum narbonense L.* from Turkey: A phytochemical study. *Industrial Crops and Products*. 2015;70:1-6.

CONTENT:

Grechko S.I., Trefanenko I.V., Shumko G.I., Shuper V.O., Reva T.V. Combined control of the heart rhythm in patients with acute coronary syndrome	3
Dudenko V.G., Avrunin O.G., Tymkovich M.Yu., Kurinnyi V.V. Construction of a statistical three-dimensional model of the human diaphragm on the basis of tomography findings	6
Sakhatska I.M. Market analysis on medicinal plant raw material	9
Kondratiuk O.S., Korshun M.M., Garkavii S.I. Adaptive capacity assessment of primary school children in case of various forms of organization of physical training classes	12
Kononova O.V. Influence of psychosomatic conditions on the periodontal tissue of patients	15
Pavlovych L.B., Bilous I.I. Pathogenetic treatment of diabetic polyneuropathy	20
Badiuk M.I., Shevchuk O.S., Biryuk I.G., Kukovska I.L., Kovalchuk P.E., Sykrytska T.B. Developmental features of up-to-date combatants psychological support	23
Dmytrenko R.R., Galagdina A.A. Age functional peculiarities of the gingival tissue response in rats to discontinuous hypobaric hypoxia and photoperiod of a different duration	27
Masoumikia R.Y., Ganbarov Kh.G., Abdullayeva N.A., Youshari N. Screening, isolation and identification lactic acid bacteria with probiotic potential from traditional dairy products of Azerbaijan	30
Melnik A.V. Effect of polyphenol compounds on the aorta state in male and female rats under conditions of hyperhomocysteinaemia	35
Kholodkova O., Prus R., Sadovska Y., Horiuk I., Ternovyi D. Peculiarities of structural changes in the liver, myocardium and kidneys of rats at different age under conditions of craniocerebral injury	39
Arzu Kaska, Nahide Deniz, Ramazan Mammadov Antioxidative capacities and phenolic compounds of various extracts of <i>Aubrieta Deltoidea</i>	42
Goshovska A.V., Goshovskyi V.M., Proniayev D.V., Sharhan V.I. Assessment of intrauterine fetal condition in women with prolonged pregnancy	47
Cherkasova V.V. Oxidative stress in case of acute pancreatitis and under conditions of dexamethasone correction	50
Polianskyi I.Yu., Moroz P.V. Peculiarities of immunological and metabolic disorders in case of diffuse peritonitis with different variants of IL1 β (-511 c/T) gene	55
Kryvetska I.I. Pedagogical innovations personality oriented approach in the doctor's professional training system	61
Fochuk P., Kasiyanchuk M., Kasiyanchuk R., Kramer B. Morphological background saving opportunities for adaptive soft tissue to the second stage of dental implantation	64
Batih V.M., Ivanitska O.V., Borysenko A.V., Lynovytska L.V. Treatment of chronic apical periodontitis in patients with prevalent parasympathic vegetative nervous system	69
Boyчук O.M., Bambuliak A.V., Galagdina A.A., Dmytrenko R.R. Assessment of the ethmoid bone size in the perinatal period of human ontogenesis and infants	74
Fedoruk O.S., Vizniuk V.V. Analysis of morphological examination of animal kidneys under conditions of ozone therapy	77
Kurta S.A., Ribun V.S., Fedorchenko S.V. Dewaxing of motor fuels is the complex method of increasing the octane and cetane numbers of gasoline and diesel	81



Deutscher Wissenschaftsherold **German Science Herald**

Bibliographic information published by the Deutsche Nationalbibliothek
The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed
bibliographic data are available on the Internet at <http://dnb.dnb.de>

№ 3/2017 – 23
Passed in press in August 2017



WirmachenDruck.de

Sie sparen, wir drucken!