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«Окружающая среда и здоровье населения»**



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заведующий кафедрой общей гигиены **А.М. Черных**

Составитель: **В.А. Ряднова**
Компьютерная верстка: **А.А. Денисов**

Рецензент: заведующий кафедрой общей гигиены,
д.м.н., профессор **А.М. Черных**

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ОГЛАВЛЕНИЕ

КУЛЬТУРА ЛИЧНОСТНЫХ И ПРОФЕССИОНАЛЬНЫХ КАЧЕСТВ СТУДЕНТОВ-МЕДИКОВ И ПРАКТИКУЮЩИХ ВРАЧЕЙ <i>Ковалевский Д.В., Колеснева В.К.</i>	10
EPIDEMIOLOGY OF MALARIA IN SRI LANKA AND ITS PREVENTION <i>Yonhewa Kawya De Silva, Arambawattage Nayana Sithara Arambawatta</i>	14
МОРФОЛОГИЧЕСКИЕ ОСОБЕННОСТИ ОСТРОГО АППЕНДИЦИТА У ДЕТЕЙ С COVID-19 <i>Горохов К.Р., Зорин И.А., Демяшкин Г.А.</i>	20
ОЦЕНКА РАСПРОСТРАНЕННОСТИ ИСПОЛЬЗОВАНИЯ ЭЛЕКТРОННЫХ СИГАРЕТ СТУДЕНТАМИ МЕДИЦИНСКОГО УНИВЕРСИТЕТА <i>Зелинская М.Ю., Исюткина-Федоткова Т.С., Макарова В.В., Шашина Е.А., Митрохин О.В.</i>	23
ИММУНОГИСТОХИМИЧЕСКАЯ ОЦЕНКА ЖИЗНЕННОГО ЦИКЛА КЕРАТИНОЦИТОВ ПОСЛЕ ОДНОКРАТНОГО И ФРАКЦИОННОГО ОБЛУЧЕНИЯ ЭЛЕКТРОНАМИ <i>Марукян А.Х., Шаповалова Е.Ю., Вадюхин М.А., Демяшкин Г.А.</i>	27
ХАРАКТЕРИСТИКА НЕЙРОНАЛЬНОГО ПОВРЕЖДЕНИЯ В ПТЗ-МОДЕЛИ ЭПИЛЕПСИИ <i>Григорян М.С., Зорин И.А., Шаповалова Е.Ю., Демяшкин Г.А.</i>	30
СВЯЗЬ НАУЧНОЙ ПРОБЛЕМАТИКИ МОРАЛЬНЫХ ДИЛЕММ С ПРОБЛЕМАТИКОЙ ЗДОРОВЬЯ И СУБЪЕКТИВНОГО БЛАГОПОЛУЧИЯ В НАУЧНЫХ ИССЛЕДОВАНИЯХ <i>Моргун Л.А.</i>	33
МОРФОЛОГИЧЕСКАЯ ХАРАКТЕРИСТИКА СПЕРМАТОГЕНЕЗА У ПАЦИЕНТОВ С COVID-19 <i>Болдырев Д.В., Демяшкин Г.А., Вадюхин М.А., Гусейнова Н.А.</i>	36
АНТИОКСИДАНТНАЯ АКТИВНОСТЬ ЭКСТРАКТА MATRICARIA CHAMOMILLA В УСЛОВИЯХ IN VIVO <i>Абдуллаев А.А., Гайибов У.Г., Гайибова С.Н., Арипов Т.Ф.</i>	39

МОЧЕКАМЕННАЯ БОЛЕЗНЬ В ЭНДЕМИЧНЫХ РЕГИОНАХ РФ И МИРА (ОБЗОР ЛИТЕРАТУРЫ) <i>Просянных М.Ю., Константинова О.В., Анохин Н.В., Войтко Д.А., Сивков А.В., Аполихин О.И.</i>	145
ПОБОЧНЫЕ ЭФФЕКТЫ И ОСЛОЖНЕНИЯ ВЫСОКОМОЩНОЙ БРАХИТЕРАПИИ ПРИ ЛЕЧЕНИИ РАКА ПРЕДСТАТЕЛЬНОЙ ЖЕЛЕЗЫ <i>Щукина Е.О., Бирюков В.А., Ермакова Н.Б., Карякин О.Б., Санин Д.Б., Лепилина О.Г.</i>	150
ПРОБЛЕМА ПИТАНИЯ У СТУДЕНТОВ-МЕДИКОВ <i>Волобуева А.А., Полоникова А.А., Хачатрян В.А., Миляев А.М. Дроздова Е.Л.</i> ..	153
EDUCATIONAL METHOD IN HYGIENE AMONG THE POPULATION FOR THE POST-COVID ERA <i>Nurul Hanis Ameera B.N.H., Rajkumar Densingh Samuel Raj</i>	155
CHALLENGES AND SOLUTIONS IN HEALTH CARE ORGANIZATION AND MANAGEMENT <i>Korekar K.P., Rajkumar D.S.R.</i>	158
РАСПРОСТРАНЕННОСТЬ ИСМП В РОССИИ И ЗА РУБЕЖОМ. ПРОФИЛАКТИКА ИСМП В МЕДИЦИНСКОЙ ОРГАНИЗАЦИИ <i>Авдеева Е.Ю.</i>	160
АНАЛИЗ ПРОЦЕССОВ ЦИФРОВИЗАЦИИ В СИСТЕМЕ ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ УЗБЕКИСТАН <i>Даминова К.М., Искандарова Ш.Т.</i>	164
ВЛИЯНИЕ КОРОТКОГО МЕЖРОДОВОГО ИНТЕРВАЛА НА ЗДОРОВЬЕ МАТЕРИ И РЕБЕНКА <i>Назарова С.К.</i>	169
AIR POLLUTION IN THE CITY OF ALMALYK <i>Salomova F.I., Sherkuzieva G.F., Akhmadalieva N.O., Sadullaeva Kh.A.</i>	174
ВНЕДРЕНИЕ ПРОГРАММНОГО ОБЕСПЕЧЕНИЯ ДЛЯ ОНЛАЙН-МЕДИЦИНСКИХ ЗАПИСЕЙ <i>Расулова Н.Ф., Джалилова Г.А., Мухамедова Н.С.</i>	177

AIR POLLUTION IN THE CITY OF ALMALYK

Salomova F.I., Sherkuzieva G.F., Akhmadalieva N.O., Sadullaeva Kh.A.

Tashkent Medical Academy, Tashkent, Узбекистан

It is well known that air pollution is one of the most serious environmental threats to human health. Emissions from industrial, transport, energy and other manufacturing enterprises cause air pollution in large cities and polluted air moves several thousand kilometers outside the city. According to the UN, 80-85 billion tons of fuel have been burned since the birth of life on Earth, and half of them have come in the last 25 years [1].

For Uzbekistan, air pollution is also one of the main environmental problems. Air pollution of the republic has a natural and anthropogenic character. Consider natural sources of pollution: on the territory of Uzbekistan there are large natural sources of dust entering the atmosphere - poorly fixed sandy soils and the surfaces of salt marshes of the Karakum, Kyzylkum and Aralkum deserts (the drained part of the Aral Sea). The gross removal of sand and salts only from the dried bottom of the Aral Sea reaches 40-45 million tons / year, and the main processes of dust and salt transfer occur within 300 km of the coastal strip. Salt and dust storms from the Aral Sea increased the level of suspended particles in the Earth's atmosphere by more than 5% [2].

The industry of Uzbekistan includes a large machine-building complex, metallurgical plants for the production of ferrous and non-ferrous metal, new factories for the production of cars and buses, large chemical enterprises for the production of mineral fertilizers, cement plants, a diversified industrial complex of light industry (cotton ginning, cotton and silk industries), medium and small enterprises for the processing of fruits and vegetables and the production of food products. The fuel and energy complex is an important component of the economy of Uzbekistan and includes the electric power industry, thermal power engineering and the oil and gas industry. The level of atmospheric air pollution is quite high in the cities of Almalyk, Bekabad, Chirchik, Andijan, Navoi, Karshi, which are the centers of the economic regions of the republic, and where the chemical industry, metallurgy and mechanical engineering are concentrated.

The purpose of this work is to analyze data on air pollution City Almalyk.

Materials and methods of research: the analysis of data on air pollution in the city of Almalyk was carried out on the basis of the reporting data of the Monitoring Service for Atmospheric, Surface Water and Soil Pollution of the Center for Hydrometeorological Service of the Republic of Uzbekistan.

Results and its discussion. Pollutants entering the atmospheric air from stationary and mobile sources can create high concentrations not only at the place of release (the territory of an industrial site, the location of large motor transport hubs and highways, etc.), but also spread beyond the territory of the sanitary protection zone, including the territory of residential areas. The content of the main pollutants in the air basin of the city depends not only on the size of the settlement and its industrial potential, but also on the physical and geographical features of the territory (relief, meteorological conditions, etc.), as well as the layout of settlements.

All of the above applies to a large extent to the city of Almalyk. The city of Almalyk is located in the southern part of the Tashkent region, 70 km southeast of the capital of the republic, Tashkent. The city is located at the foot of the Kuraminsky Range along the left bank of the Akhangaran River within its lower and upper terraces. The territory surrounding the city from the northern and western sides belongs to the lower terrace of the Akhangaran River. The territory from the south, southeast, east has a complex and rugged relief, with heights of 490-520 m above sea level. Climate: continental-subtropical with high summer temperatures and low rainfall, cold and unstable winters. Precipitation falls mainly in autumn and winter. Zone of high climatic potential of atmospheric pollution (PAP) [3].

The main sources of air pollution: Mining and smelting plant, whose emissions are 95% of emissions from stationary sources: Ammophos-Maxam JSC, Mega-Mebiko JV LLC, furniture factory, thermal power plant, boiler houses, brick factory, road transport.

Air quality: Observations are carried out at 3 stationary posts of Uzhydromet. Posts are divided into: urban «background» - in residential areas (PNZ № 5) – in the area of the central market and a furniture factory, «industrial» – near enterprises (PNZ № 3), «auto» - near highways or in areas with heavy traffic transport (PNZ № 1). Prior to the placement of industrial enterprises and the development of the city, it was divided into 3 districts: Boarding, Raduga, Saodat, this made it possible to establish posts in each district of the city. Additionally, under-flame observations are carried out in the area of the AGMK. TsGSEM of the Ministry of Health.

Dust concentrations: The average concentration was 0.1 mg/m³ (0.7 MPC d.s.), the maximum one-time concentration was 0.2 mg/m³ (0.4 MPC m.s.). API = 0.56. The average concentration of sulfur dioxide for the year was 0.056 mg/m³, exceeding the MPC d.s. by 1.1 times, the maximum one-time concentration was recorded at post No. 1 in February and amounted to 0.602 mg / m³, exceeding the MPC m. 1.2 times. API = 1.12. The average concentration of carbon monoxide for the year was 3 mg/m³ (1.0 MPC d.s.). The maximum one-time concentration was recorded at post No. 1 in January and amounted to 6 mg/m³, exceeding the MPC m.r. 1.2 times. API = 1.11. The average concentration of nitrogen dioxide was 0.04 mg/m³ (1.0 MPC d.s.). The maximum single concentration was 0.06 mg/m³ (0.7 MPC m.s.). API = 0.90. The average concentration of nitric oxide was 0.02 mg/m³ (0.3 MPC d.s.). The maximum single concentration was 0.04 mg/m³ (0.1 MPC m.s.). API = 0.38. The average annual concentration of ozone was 0.024 mg/m³ (0.8 MPC d.s.). The maximum one-time concentration was 0.054 mg/m³ (0.3 MPC m.s.). API = 0.68. The average annual and maximum one-time concentrations of phenol, hydrogen fluoride, solid fluorides, ammonia did not exceed the MPC. The concentrations of heavy metals: cadmium, lead, copper, zinc did not exceed the MPC.

According to the under-flare observations of the Central State Sanitary and Epidemiological Service of the Ministry of Health of Uzbekistan in the area of the AGMK, the maximum concentrations were as follows: dust – 2.2 MPC m.r. registered at a distance of 1 km from the emission source; sulfur dioxide – 4.6 MPC m.s. registered at a distance of 4 km from the emission source; carbon monoxide – 1.2 MPC m.s.; nitrogen dioxide – 1.6 MPC m.s.; phenol – 1.6 MPC m.s.; hydrogen fluoride – 0.9 MPC

m.s.; ammonia – 1.4 MPC m.s. In the area of OAO Ammofos-Maxam, the maximum concentration of sulfur dioxide is 3.3 MPC m.s.; nitrogen dioxide – 0.6 MPC m.s.; hydrogen fluoride – 0.9 MPC m.s.; ammonia – 0.5 MPC m.s.

The concentrations of heavy metals: cadmium, lead, copper, zinc did not exceed the MPC. Air pollution level is low API = 4.30.

1. The level of atmospheric air pollution in the city of Almalyk is due to emissions of harmful substances from stationary and mobile sources, as well as a high climatic potential for air pollution.

2. The average annual content of sulfur dioxide exceeded the sanitary norm by 1.1 times. The maximum one-time concentration exceeded the maximum allowable values in the city of Almalyk – 1.2 times.

3. The content of carbon monoxide in the atmospheric air did not exceed the MPC d.s. The maximum values of one-time concentrations were in the city of Almalyk – 1.2, MPC m.r. The reason is the concentration of emissions from motor vehicles and boiler houses during the period of adverse meteorological conditions (NMU), as well as uncontrolled burning of garbage and industrial waste.

4. Atmospheric pollution with nitrogen dioxide on average in the Republic is below the MPC d.s. And in the city of Almalyk – 1.0 MPC s.s. The reason for the observed maximum one-time concentrations is the emissions from motor vehicles and their accumulation during the NMU period.

5. The average annual content of nitrogen oxide in the city of Almalyk remains at the level of 0.2-0.5 MPC d.s. The maximum values of this impurity did not exceed MPC m.r.

6. The content of heavy metals in the air in the city of Almalyk did not exceed the maximum permissible values. In 2018, the level of air pollution, characterized by the air pollution index in all cities of the Republic, including in the city of Almalyk, was low.

Air pollution cannot but affect human health and causes an increase in the number of chronic respiratory diseases, bronchial asthma, chronic bronchitis, emphysema, shortness of breath, lung cancer, cardiovascular diseases, skin diseases and eye diseases in humans. Therefore, monitoring of atmospheric air pollution determines and corrects the direction of recreational activities.

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