performed on a computer system for digital image analysis of VIDAS-386 (Germany) in the visible spectrum.

The function of neurons of medial small cell and lateral large cell subnuclei of the PVN of rat hypothalamus is marked by circadian rhythms. The decrease in densitometric parameters is more pronounced in the lateral large cell nuclei, in particular in the samples taken for study at 2 am there was a probable decrease in the area of the neuron by 11.2% ($p < 0.01$) due to a decrease in the area of its nucleus by 13.8 % ($p < 0.01$), nucleoli - by 10.6% ($p < 0.05$) and cytoplasm by 7.8% ($p < 0.05$), and also observed a decrease in RNA concentration in the nucleus - by 7.1% ($p < 0.05$) relative to similar values obtained during the day.

Under the conditions of light deprivation, desynchrony of the activity of studied neurosecretory cells of hypothalamus and a shift of the largest values of area of the neuron structures from 2 pm to 2 am are manifested. Absence of the expressed strengthening of functional activity of medial small-cell subnuclei and probable differences of the area of neuron bodies, their nuclei, nucleoli, cytoplasm, concentration in them of RNA, nuclear-cytoplasmic ratio, specific nuclei and cytoplasm in animals exposed to light modes 12.00L: 12.00D and 24.00L: 00D allows to assume wide limits of the plasticity of the studied neurosecretory cells when keeping animals under constant lighting conditions during the week.

Karavan Y.V.

NEW GENERATION OF PESTICIDES AND THEIR IMPACT ON HUMAN'S HEALTH

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Despite the increasing of level of life in most of countries, the level of human's health nowadays extremely decreases. This could be explained due to the influence of different artificial matter which is produced by people for facilitation of living and household conditions. The examples of such matter could be different chemicals used for cleaning and washing, cosmetics, artificial waxes and resins, pesticides etc.

Pesticides are chemical compounds that are used to kill pests, including insects, rodents, fungi and unwanted plants (weeds). Over 1000 different pesticides are used around the world. Pesticides are used in public health to kill vectors of disease, such as mosquitoes, and in agriculture to kill pests that damage crops.

Main goal of the publication is to pay attention of people to the harmful effects of pesticides for human's health.

Nowadays several groups of pesticides are used in agriculture with different functions and chemistry. These groups include herbicides for destroying weeds and other unwanted vegetation, insecticides for controlling a wide variety of insects, fungicides used to prevent the growth of molds and mildew, disinfectants for preventing the spread of bacteria, and compounds used to control mice and rats. Since the start of the production boom in the 1940s to present day, a huge catalog of thousands of insecticides, herbicides, and general pesticides was developed, including organochlorides (DDT, BHC), organophosphates (Parathion, Malathion, Azinophos Methyl), phenoxyacetic acids (2,4-D, MCPA, 2,4,5-T), Captan, Carbamates (Aldicarb, Carbofuran, Oxamyl, Methomyl), neonicotinoids (Imidacloprid, Acetamiprid, Clothianidin, Nitenpyram), and Glysophates.

Residues of pesticides can be found in a great variety of everyday foods and beverages, including for instance cooked meals, water, wine, fruit juices, refreshments, and animal feeds. Furthermore, it should be noted that washing and peeling cannot completely remove the residues. In the majority of cases, the concentrations do not exceed the legislatively determined safe levels. The most suitable method of measuring pesticides concentrations if gas chromatography, HPLC and mass-spectrography. However, these "safe limits" may underestimate the real health risk as in the case of simultaneous exposure to two or more chemical substances, which occurs in real-life conditions and may have synergistic effects. Pesticides residues have also been detected in human breast milk samples, and there are concerns about prenatal exposure and health effects in children.

The numerous negative health effects that have been associated with chemical pesticides include, among other effects, dermatological, gastrointestinal, neurological, carcinogenic, respiratory, reproductive, and endocrine effects. The type of pesticide, the duration and route of exposure, and the individual health status (e.g., nutritional deficiencies and healthy/damaged skin) are determining factors in the possible health outcome. The last research untangles complex interactions between genetic variation, pesticide exposure, and Parkinson's disease. Such gene-environment interaction is termed G x E. Scientists showed that two pesticides have been linked to Parkinson's — paraquat and a plant-derived pesticide called rotenone. Paraquat has a chemical structure similar to MPTP.

So, according to the information mentioned above, there are two opposite points of view. Use of pesticides provides economic and social benefits as they help to keep food prices relatively low and pesticides are potentially toxic for living organisms, including humans. Where is true? Somewhere between these ideas. People should protect their crops from pests to have food, but these protective mechanisms should be safe for the health and environment.

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FEATURES OF THE SPREAD AND INFECTION OF *PLASMODIUM KNOWLESI*

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According to WHO, the number of cases of malaria infection is up to 500 million annually and is growing by 16% annually. In addition to the 4 known species of *Plasmodium*, malaria is also caused by the previously unknown *P. knowlesi*. To date, it has been proven that *P. knowlesi* is able to infect not only monkeys, as was previously known, but also humans. This new species of the causative agent of the disease was discovered relatively recently in Southeast Asia (Malaysia) and therefore is still quite poorly studied. Taking into account the annual increase in the incidence of malaria, including *P. knowlesi*.

The aim of this work is to characterize the spread and infection of humans with this parasite species.

The life cycle of *P. knowlesi* is the shortest of all known *Plasmodium* species in both humans and animals, which explains the daily attacks of malaria in these patients. In this case, both young and old erythrocytes are damaged, which causes the development of high parasitemia, and the development of parasites in these cells is asynchronous. The large number of *knowlesi*-malaria cases in humans indicates that *P. knowlesi* is more capable of infecting humans than other *Plasmodium* species that cause malaria in primates. If natural human-mosquito-human transmission is established, *P. knowlesi* can spread even more in Asia. As in the case of infection with the four more well-known species, a person becomes infected with *P. knowlesi* at the time of inoculation by a female of malaria mosquito at one of the life cycle stages of the pathogen (so-called sporozoites) into the blood or lymphatic system, which occurs during bloodsucking. After a short stay in the blood, the malaria *Plasmodium* sporozoites penetrate into the hepatocytes of the liver, thereby giving rise to the preclinical hepatic (exoerythrocytic) stage of the disease. In the process of asexual reproduction, called schizogony, from one sporozoite, about 2.000 to 40.000 hepatic merozoites, or schizonts, are eventually formed. In most cases, these daughter merozoites re-enter the bloodstream after 1-6 weeks. Diagnostic errors are associated with morphological similarities between *P. knowlesi* and *P. malariae* – the blood stages of reproduction of these two parasites are very difficult to distinguish under light microscopy. However, *P. malariae* multiplies after 72 hours and never reaches dangerously high blood densities, *P. knowlesi* causes malaria with daily attacks, and without treatment, the pathogen can quickly reach a potentially fatal density.

Thus, *P. knowlesi* is the fifth malaria parasite that, after crossing the interspecies barrier, causes a special type of zoonotic malaria in humans, usually affecting macaques. This pathogen differs from other *Plasmodium* species in the shortest life cycle, which explains the daily attacks leading to severe and often fatal outcomes.