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The influence of comets with the approaching to the Earth is manifested in the changes of the electricity near-Earth space, increasing dustiness of the atmosphere, which, in turn, causes to a decrease in its transparency and increase precipitation. Following year, after the passage of comets near the Earth, there is an increase in the rivers water flow. For the Southern Buh River near the Oleksandrivka village, the mean increase coefficient of water flow is 1.21.

For the Southern Buh River near the Oleksandrivka village the multi-annual mean of water flow is $83.7 \text{ m}^3 \cdot \text{s}^{-1}$ (for the period 1914-2019). During the Great Confrontations of Mars, the mean annual discharges in the mean exceeds the multi-annual mean value by 1.12 times, and during the Great Confrontations of Jupiter – is only 0.91 from the multi-annual mean value. The next Great Confrontation of Mars will take place in 2035, and the Great Confrontation of Jupiter – in 2022. In these years the forecast values of mean annual discharges will be 94.1 and $76.0 \text{ m}^3 \cdot \text{s}^{-1}$, respectively.

Application of the α method for long-term forecasting of river water flow is possible in the case when in the time series have a sequential alternation of periods with increased and decreased water flow at a strictly defined of averaging period $T = 9, 10, 11, \dots, n$ years. On the Southern Buh near the Oleksandrivka village the time series of water flow have the successive alternation of 15-year periods with increased and decreased flow (Fig. 1). It is allowing to make a long-term forecasting of water flow for the periods 2012-2026 and 2027-2041. According to the forecast a significant increase in the mean annual water flow should be expected in the period 2020-2041 compared to 2015-2019 (Fig. 1).

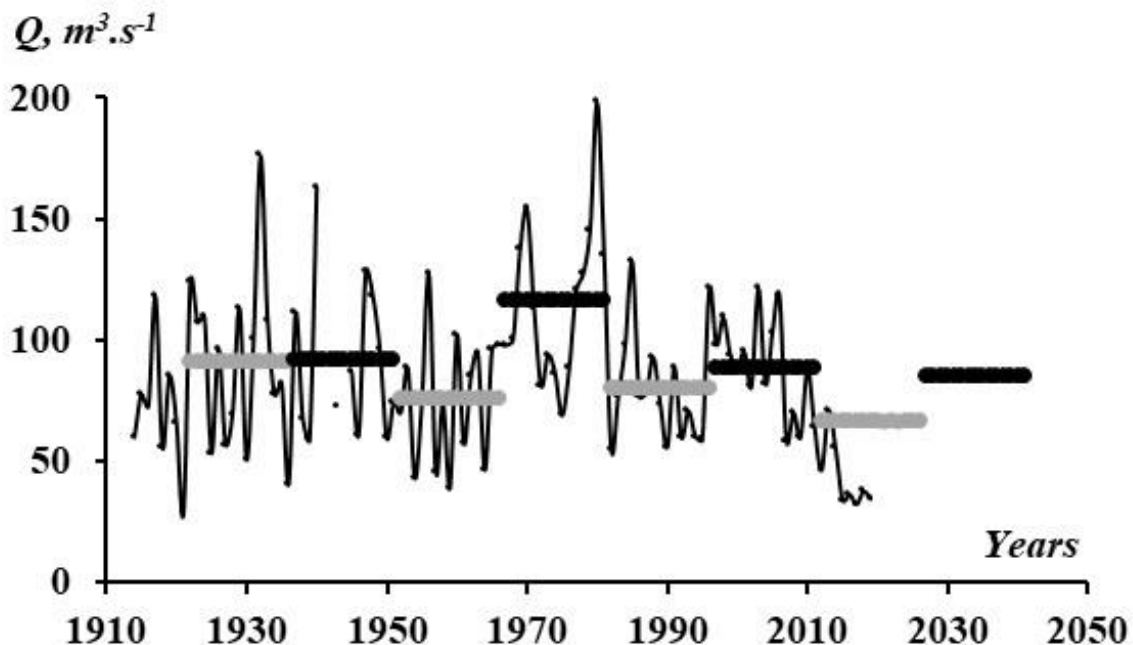


Fig. 1. Successive alternation of 15-year periods of water flow (gray color - years of low water flow, black color - years of high water flow) on the Southern Buh near the Oleksandrivka village and forecast for 2012-2026 and 2027-2041.

**DISPERSAL AND DEVELOPMENT OF BEET WEBWORM
LOXOSTEGE STICTICALIS (L.)
IN DIFFERENT REGION OF UKRAINE**

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The beet webworm *Loxostege sticticalis* (L.) belongs to the family Pyraustidae, type of Lepidoptera (Chen X. et al., 2008; Heppner J.B., 1998; Prado B.R. et al., 2011; Tunca H. et al., 2009). The beet webworm *Loxostege sticticalis* (L.) is characterized by cyclic outbreaks of population boom. Many scientists have tried to analyze the causes of this depredator's population boom. According to entomological chronicles, the first boom was dated in Ukraine in 1686 (Malysh J.M. et al., 2014).

It is a dangerous depredator that damages a wide range of crops, has high reproduction capability, adaptability and harm. They can fly over long distances and populate large areas within 2-3 days. This species is widespread in Eurasia and North America (Hampson G.F., 1899). This is a typical polyphagous depredator, and its caterpillars can damage plants from 35 families of crops (Karsholt O., Razowski J. (Eds.), 1996; Mayr E. et al., 2012; Michener C.D., et al. 1970). The favorable plants for it from agrestic weeds are like saltbush, bindweed, sagebrush to cultivated plants like beets, sunflowers, bean family. In different zones of Ukraine, one to three generations of the beet webworm *Loxostege sticticalis* (L.) develop in Polissia, the forest steppe and in the north of the steppe; there are two generations in the south of the steppe and three - in Crimea. The flight of the beet webworm *Loxostege sticticalis* (L.) is observed from May to October: the departure of the wintering generation starts at the end of April to May, the first - in June to July, the second - in July to September (Beletsky E.N., 1993; Masliiov S.V. et al., 2018; Pepper J.H., 2003).

The field data was obtained in 2021 at the research field in the different region of Ukraine (Zaporizhia, Luhansk, Donetsk, Kherson, Kyiv, Kharkiv, Dnipropetrovsk, Cherkasy regions).

In 2021, the first spring generation had the most favorable conditions for development - enough moisture, moderate temperatures, presence of flowering vegetation, which led to a significant increase in the number of depredators, especially in the centers of the southeastern and sometimes central areas. In most areas in the spreading zones, the beet webworm *Loxostege sticticalis* (L.), developed within three generations, except for Kharkiv, Poltava and Vinnytsia regions, where only two generations were noted.

The beet webworm *Loxostege sticticalis* (L.) flight began in mid-May last year. At the edges of the field of sunflower, winter wheat, corn, on noncroplands,

in perennial grasses in Kyiv, Kharkiv, Dnipropetrovsk, Cherkasy regions where the average number of predators of bulla was from 2 to 22 ex./10 steps, sometimes in the centers of Zaporizhia, Luhansk, Donetsk regions its number ranged from 10 to 160 ex./10 steps. The flight strength of the meadow moths of the 1st generation (from 2 to 50 ex./10steps) was observed within all areas of the steppe zone and somewhat smaller (from 1 to 12 ex./10 steps) in Kyiv, Cherkasy and Sumy regions.

Mass rebirth of caterpillars began in early June. The caterpillars damaged beets, sunflower, corn, leguminous crops, perennial grasses. The average number of predators was 2.0-12.0 ex./m², in Zaporizhia, Luhansk, Donetsk, Kharkiv, Sumy regions locally on lucerne, sunflower, soybeans, corn, sugar beet amounted to 6.0-14.0. ex./m². That means 5-20 % of plants were damaged.

Beet webworm *Loxostege sticticalis* (L.) flight of the 2nd generation began in the middle of June. Second generation of caterpillars was populated in the central and western regions and therefore from 4 to 22 % of plants within 2-10 % of areas of sunflower, corn was damaged. But the most locally were planted up to 46 % of areas of perennial grasses in Cherkasy region with the number of 0,3-6,0 ex./m². In the southern and eastern regions 8-28 % of plants were planted on the territory of 12-4 5% of sunflower areas, corn, in the amount from 2 to 12 ex / m², maximum - up to 30-55% of plants, that means up to 20 ex/m² that is on the threshold level in Zaporizhia and Mykolaiv regions. The third generation of phytophagus development occurred in the central regions from the end of August to the end of September. The flight strength of the beetle webworm *Loxostege sticticalis* (L.) was different, in the eastern regions - 5 to 40 ex/10 steps, in the central ones - slightly weaker. The number of caterpillars was smaller than the previous generation (2 to 6 ex / m², maximum 32 ex. / m²) on the particular areas of Zaporizhia and Mykolaiv regions.

Since the beginning of 2000 the sunflower growing areas in Ukraine have increased twofold in fact and they exaggerated a scientifically substantiated and recommended index – 8 % in the structure of the crops interchange system without hard crop rotation which has become the main reason for a strong increase of the number of the beetle webworm *Loxostege sticticalis* (L.) and appearance of a new-old pest, aggressiveness of which have increased to the utmost under such conditions. Thus, it can be concluded that within recent years, as a result of the ecological and economic factors (decreasing the land cultivation, deterioration of agricultural technology and global warming) constant locations of meadow moths were formed in the southern regions. The condition of the population indicates an average degree of threat. However, the danger of possible population boom of predator wintering generation still remains in Zaporizhia, Luhansk, Donetsk and Kherson regions, somehow lower - in the northern and central regions.