Gulay V. V., Ph.D in agriculture

Kirovorgad state pedagogical university

THE ALLELOPATHIC CONNECTIONS OF SPIROCHETES *LEPTOSPIRAINTERROGANS* IN PHYTOCOENOSISES OF MARSHY MEADOWS.

Reviewer – doctor of agricultural sciences, professor I. N. Danilkiv

There is information on the environmental characteristics of the relationship of higher plants and pathogenic leptospirs in plant communities marshy meadows Forest-Steppe zone of Ukraine. The basis of the environmental impact of these representatives vegetation habitats for spirochetes are topical type of biotic linkages, resulting in the allocation of water-soluble substances allelopathy activity as living plants and their residues. In general, background vegetation types show a negative effect on the pathogen leptospirosis, which reduces the time spent in these spirochetes phytocenoses marshy meadows.

Key words: *phytocoenoses marshy meadows, biochemical effects, pathogenic leptospira*

Formulation of the problem. Spirochetes (Leptospirainterrogans) is the causative agent of infectious diseases of farm animals and humans. The degree of epizootic and epidemiological risk of certain areas, including within the Forest -Steppes zone of Ukraine depends on the duration of the infectious agent in the objects of the environment, which in turn is determined primarily by environmental constraints leptospira with components biogeocoenoses. A variety of animal and plant species can significantly affect the density of leptospira in environmental objects. Therefore, the disclosure of qualitative and quantitative characteristics of this interaction determine the practical significance of the research.

Within Ukraine forest-steppes zone marshy meadows are sufficiently common type of plant communities. It grows large number of higher hydrophilic plants, among which are the dominant *Carex vulpina*, *Poa palustris*, *Beckmanniaeruciformis* and others. Subordinate role is played by *Polygonumpersicaria* and many other water-loving plants [1]. Biochemical impact of these plants can significantly affect the structure microbiocoenoses these habitats.

Analysis of major studies and publications which discuss problems. Ecological interactions between pathogenic leptospira and components zoocoenoses disclosed in the literature quite extensively. About that information that would disclose the features of the interaction of microorganisms with representatives of plant communities enough. In a special scientific literature are fragmentary data on these issues. Information on the impact on the culture of pathogenic leptospirs 16 species of aquatic plants [4]. Method for studying pathogenic leptospirsbiocenotical relationships with higher plants and the criteria for assessing the nature and degree of the influence of biologically active substances in the culture of these microorganisms developed [3]. Established ecological relationships leptospira and vegetation present floodplain meadows. [5]

Given the lack of information on the biochemical interaction with representatives of higher vegetation agent of leptospirosis on waterlogged lands there is a theoretical and practical need for research to uncover the problems outlined circle.

Aims and objectives of research. The aim of research was to characterize alelopathyconectsleptospira with widespread species of higher plants in phytocenoses of marshy meadows. Objectives of research:

- To conduct qualitative and quantitative assessment of in vivo effects of discharge widespread species of higher plants of marshy meadows in the culture of pathogenic leptospira;

- To conduct a qualitative and quantitative assessment of effects of decomposition products of higher plants of marshy meadows on pathogenic leptospirs culture;

- Estimate the value of marshy meadows as potential natural fireplace of leptospirosis due to the impact of widespread vegetation on the viability of pathogenic leptospira.

Materials and methods research. The influence of lifetime and lifetime emissions of background species plant communities present floodplain meadows in the museum culture of pathogenic leptospira strains of Leptospirainterrogans serotype Icterohaemorrhagiae. Getting vivo secretions of plants (root and leaf flushing) and extraction of deads vegetative plant parts was performed by the method of A. Grodzinsky [2]. Alelopaty activity of plants against pathogenic leptospira tested by us in diluted 1:1000. In samples made 0.4 ml of working solution and in vivo lifetime emissions of plants and 0.1 ml of culture leptospira. Control - similar ratio of distilled water and leptospira cultures. Since the inoculum were selected from the same bacterial cultures, the initial density of spirochetes in the experimental and control tubes was the same. Density cultures of leptospira, 24 hours after the start of the experiment was determined by direct counting of leptospira in a known volume method by Samostrelskiy [6]. To assess the severity of the impact of dietary selections of plants in culture spirochetes using indicators that have been proposed [3].

Results of researches. Analysis of the results of experiments suggests that most species show a depressing effect on the culture of pathogenic leptospira. Thus, root excretions of *Polygonumpersicaria* showed the greatest negative impact among selected species and was 42.4%. At least something was marked inhibition of leptospira cultures in solutions with root excretions of *Beckmanniaeruciformis* (24.6%) and *Poa palustris* (21.3%).

Study of the influence of leaf washings of these species makes it possible to argue that the most significant negative impact showed substances were obtained from*Polygonumpersicaria*. Inhibition rate was 48.2%. Other plants showed some inhibition of lower rate. So for *Poa palustris*it was - 29.5%, and for *Beckmanniaeruciformis*was 19.8%.

Effects of extracts derived from remains of dead plants in the culture of pathogenic leptospira had a negative impact. In the studied greatest degree of inhibition was characterized *Polygonumpersicaria* (27.6%). In slightly less inhibition crops spirochetes was celebrated in the experimental samples obtained

from the remnants of *Poa palustris*(17.3%). The least expressive was the impact of substances that were obtained from *Beckmanniaeruciformis* (8.9%).

Among the studied widespread species plantsof marshy meadows only *Carex vulpina* was discovered the stimulating effect on pathogenic leptospira. Are most positive impact showed substances receipt of leaf washings (31.4%). Somewhat less stimulating effect showed root excretions (23.1%). At the least density culture spirochetes grown under the influence of substances that are derived from precipitation of this type plants (19.1%).

Conclusions:

1. Higher plants of marshy meadows habitats exhibit biochemical effects on pathogenic leptospires, which is the basis for such topical environmental relationships.
2. Marshy meadows, through its phytocenological features can be considered as unsuitable habitats for the emergence and preservation of cells leptospires infections, as the majority of plants that are part of the wetland biomes lands produce their secretions in vivo expressed a negative effect on the density of pathogens.
3. The nature of the impact of higher plants discharge to the agent of leptospirosis requires further study to predict occurrence and detection of foci of infection in different types of biocoenosis.

REFERENCES

1. *Григора І.М.* Рослинність України (еколого-ценотичний, флористичний та географічний нарис) / І.М. Григора, В.А. Соломаха. – К.: Український фітосоціологічний центр, 2005. – 452 с.

2. Гродзінський А.М. Основи хімічної взаємодії рослин / А.М. Гродзинський. – К.: Наукова думка, 1973. – 205 с.

3. Гулай О.В. Вивчення біоценотичних зв'язків лептоспір з водними рослинами: Методичні рекомендації / О.В. Гулай – Дніпропетровськ: ВФК «Оксамит-Прес», 2004. – 14 с.

4. Гулай О.В. Консортивні зв'язки спірохет Leptospira interrogans у прибережно-водних екосистемах: дис. … канд. біол. наук: 03.00.16 / Гулай О.В. – К., 2005. – 293 с.

5. *Гулай О.В*. Алелопатичні зв'язки спірохет *leptospira interrogans* у фітоценозах справжніх заплавних лук / О.В. Гулай, В.В. Гулай // Вісник полтавської державної аграрної академії №1 (60) – Полтава:, 2011. – С. 75-76.

6. Самострельский А.Ю. Метод прямого счета лептоспир в определенном объеме / А.Ю. Самострельский // Лабораторное дело. – 1966. – №2. – С. 105-108.