

**CHANGES IN TEMPERATURE IN THE GALL OF AULACIDEA HIERACII (HYMENOPTERA: CYNIPIDAE) ON THE PLANT HIERACIUM ROBUSTUM (ASTERACEAE) IN WINTER PERIOD**

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Conducted field experiments in winter period with temperature extremes has allowed to establish the differences in the indicators of air temperature and the temperature inside the gall (gallformer *Aulacidea hieracii*) on mighty hieracium (*Hieracium robustum*). For hourly fixing temperature of atmospheric air and the temperature inside the gall was used by the author collected device data logger. When comparing the ambient temperature and the temperature inside the gall by Wilcoxon criteria for samples with pairwise coupled variants were marked statistically significant differences ( $Z=3.61$ ;  $p=0.0003$ ). The differences confirmed by the criterion of signs ( $Z=2.33$ ;  $p=0.02$ ), which confirms the reliability of the differences of temperature inside the gall and outside on air, which is caused, apparently, thermal properties of gall. During the field experiment, the authors found that with significant sharp fluctuations in atmospheric air (12 degrees per day), within the gall there are minor fluctuations (no more than 4–5 degrees).

**Key words:** gall formation, hawk, *Hieracium robustum*, gall-inducing insect, *Aulacidea hieracii*, temperature range, gall, Saratov Province.

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#### REFERENCES

*Anikin V. V., Stepanov S. A.* Gall Insects of the Lower Volga Region and Gallogenes of Plants. Samarskaya Luka, 2001, iss. 11, pp. 262 – 271. (in Russian).

*Anikin V. V., Nikelshparg M. I.* The Parasitism Peculiarities of *Eupelmus* sp. (Hymenoptera: Eupelmidae) on *Orechovica Aulacidea hieracii* (Hymenoptera: Cynipidae) – the Gall Wasp on *Hieracium viosum*. Entomological and Parasitological investigations in Volga Region, 2017, iss. 14, pp. 67 – 71. (in Russian).

*Anikin V. V., Nikelshparg M. I., Lavrentiev M. V.* The Insects in Gall of Weevil *Smicronyx smreczynskii* (Coleoptera, Curculionidae) on Dodder *Cuscuta campestris* (Cuscutaceae). Bulletin of Botanic Garden of Saratov State University, 2017a, vol. 15, iss. 2, pp. 20 – 26. (in Russian).

*Anikin V. V., Nikelshparg M. I., Lavrentiev M. V.* Evolutionary Strategies for the Development by the Gall Insects of Their Herbaceous Food Plants on the Territory of Saratov Region. In: Proceedings of the national Park “Khvalynsky”: vol. 9. Saratov – Khvalynsk: Amirit, 2017b. pp. 241 – 244. (in Russian).

*Anikin V. V., Nikelshparg M. I., Nikelshparg E. I., Konyukhov I. V.* Photosynthetic Activity of the Dodder *Cuscuta campestris* (Convolvulaceae) in Case of Plant Inhabitation by the Gallformed Weevil *Smicronyx smreczynskii* (Coleoptera, Curculionidae). *Izvestiya of Saratov University. New Series. Series Chemistry. Biology. Ecology*, 2017, vol. 17, iss. 1, pp. 42 – 47. (in Russian). doi: 10.18500/1816-9775-2017-17-1-42-47.

*Bobrov G. P.* The weather and climate in Saratov in questions and answers. Saratov: Izdatel'stvo EMOS, 2001. 220 p. (in Russian).

*Nikelshparg M. I., Lavrentiev M. V.* Ecological and biological characteristics of the insect-halloformer (Hymenoptera: Cynipidae), developing on the hawk mighty (*Hieracium robustum* Fr. s. L.). In: *Research of young scientists in ecology and biology: vol. 14*. Saratov: Izdatel'stvo Saratovskogo Universiteta, 2016. p. 56. (in Russian).

<http://www.gismeteo.ru> (Date of access: 7.02.2018)

<http://statsoftstatistica.ru> (Date of access: 8.03.2018)