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THE MOLECULAR COMPLEXES OF THE MONOAMMONIUM SALT OF GLYCYRRHIZIC ACID WITH UREA, THIOUREA, METHYLOLTHIOUREA AND THEIR FUNGICIDAL ACTIVITY

Yusup Tojimamatovich Isaev*; **Ibragim Raxmanovich Askarov***;
Sandjar Ashiralievich Rustamov*; **Egamberdiev Doston Usmondjon ugli***;
Xabibjon Xojibekovich Kushiev**

* Department of Chemistry,
Andijan State University, Andijan, UZBEKISTAN

**Department of Biology,
Gulistan State University, Gulistan, UZBEKISTAN
Email id: yusufjon_67@inbox.ru

ABSTRACT

This article reports on the preparation of inclusion compounds of the monoammonium salt of glycyrrhizic acid with urea, thiourea and methylolthiourea. Based on the spectral data, it was concluded that complexation occurs due to the interaction of polar groups of the components. The composition of the complexes was studied using the isomolar series method. Equilibrium constants and the change in the Gibbs free energy of the complexation process were also calculated. The biological activity of complex compounds has been studied using the example of fungicidal activity against some of the most common pathogenic fungi Fusarium. The obtained compounds can be used as stimulants in agriculture.

KEYWORDS: *Pathogenic Fungi, Stimulants In Agriculture, Crops, Highly Effective Biologically Active Substances.*

REFERENCES

1. Dushkin A.V., Meteleva E.S., Khomichenko N.N., Vlasenko N.G., Teplyakova O.I., Khalikov M.S., Khalikov S.S. A new pesticide preparation based on complexes of tebuconazole and glycyrrhizin derivatives. Journal. The successes of modern natural science. - 2016. - No. 11 (part 2). - S. 296-300. DOI: 10.17513 / use.36227.
2. G.A. Tolstikov, L.A. Baltina, V.P.Grankina, R.M.Kondratenko, T.G. Tolstikova. Licorice: Biodiversity, Chemistry, Medical Applications. Novosibirsk. Publishing house GEO. 2007.S. 123.
3. Yakovishin L.A. Molecular complexes of triterpene glycosides with biologically active substances: preparation, chemical and pharmaceutical properties and biological activity. Diss. doctor farm. sciences. Sevastopol. 2018.351 p.
4. Nafisi S., F. Manouchehri, M. Bonsaii. A comparative study of glycyrrhizin and glycyrrhetic acid complexes interactions with DNA and RNA // Iranian J. Org. Chem. – 2012. – Vol. 4, № 2. – P. 841-849.
5. Isakov H. Synthesis, classification and development of technology for producing biologically active compounds with multifunctional action, based on formaldehyde and furfural. Diss. doctor tech. sciences. Tashkent. 2019.200 s.
6. Chemistry of guest-host complexes. Editors F. Vögtle and E. Weber. Per. from English Moskava. Peace. 1988 p. 384-385.
7. M.I.Bulatov, I.P. Kalinkin. A practical guide to photometric methods of analysis. Leningrad. Chemistry. 1986. p. 241.
8. Babko A.K. Physicochemical analysis of complex compounds in solutions. Publishing house of the Academy of Sciences of the Ukrainian SSR. 1955.328 s.
9. Navruzov S.V., Khashimova N.R., Akhunov A.A., Kuldosheva K.M. Influence of natural preparations on cotton yield and fiber quality during soil salinization. Universum: Chemistry and Biology. No. 11 (77), 2020. p. 49-52.
10. Khashimova N.R. The mechanism of the formation of cotton resistance to phytopathogens and the ways of its regulation. Abstract dissertation. Doctor of Biol. sciences. Tashkent. 2016.77 p.
11. Patent RUz No. IAP 05090. Method of combating cotton wilt / Akhunov A.A., Khashimova N.R., Pshenichnov E.A., Avtonomov V.A., Dalimov D.N., Matchanov O.D., Gafurov M.B. // Official Bulletin. - 2015. - No. 10.
12. Ablakulova N.A. Assessment of the effect of natural triterpenoids on wheat fungal diseases. Abstract dissertation. Doctor of Philosophy in Biol. sciences. Tashkent. 2019.42 p.
13. Booth C. Methods in microbiology. Vol.4. 1971. Academic Press London and New York. PP. 137-149, 404-421.
14. Leslie J.F., Summerell B.A. The Fusarium laboratory manual. Copyright 2006. Blackwell Publishing.

15. Kirai Z., Clement Z. et al. Phytopathology methods. M., 1974.S. 180.
16. G.A.Tolstikov, L.A. Baltina, V.P.Grankina, R.M.Kondratenko, T.G. Tolstikova. Licorice: Biodiversity, Chemistry, Medical Applications. Novosibirsk. Publishing house GEO. 2007.S. 279.
17. Isaev Yu.T., Rustamov S.A., Khozhimatov M.M., Otakhonov K.K. Study of the structure and composition of the supramolecular complex of the monoammonium salt of glycyrrhizic acid with methylolthiourea. Bulletin of NUUz. Natural Sciences. 2020.3 / 1. S.292-296.