

ENVIRONMENTALLY SAFE PLANT PESTICIDES

S.Kh. Zakirov, Z.Sh.Mukhidova, A.A.Abzalov

Tashkent State Agrarian University, Tashkent city, Uzbekistan

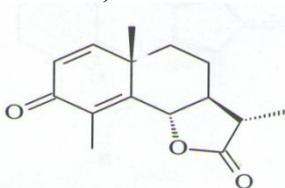
E-mail: akmal.38@yandex.ru

This article presents the results of biological tests in rice growing, as well as against the termites of the growth and insecticidal activity of a number of ecologically safe plant terpenoids. It was found that vulgaron B was lethal for termites with a rapid effect of exposure. On the fourth day after application, vulgaron B showed a 97% mortality rate. Knicin acted more slowly, and on the 15th day after the end it led to a 81% termite mortality. By the present time, as a result of our studies, a number of effective termicidal sesquiterpenoids of intestinal prolonged action from domestic flora have been identified, which, with individual application, result in 96-100% death of termites for 8-15 days of use. According to the above, deployment and expansion will lead to the creation of new highly effective pesticides that are harmless to humans and the environment.

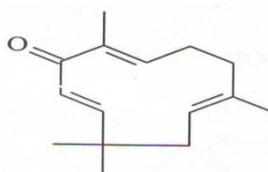
Key words: pesticide, terpenoid, sesquiterpene lactone, rice, termite, Compositae, Umbellate.

In recent years in agriculture as a pesticide began to be widely used preparations of plant origin. The advantage of these compounds over synthetic is that they do not have toxicity, are selective in biological action and are environmentally friendly to humans, animals and the environment.

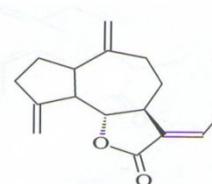
At present, the class of terpenoids, including sesquiterpene lactones, attracts the attention of a wide range of researchers, not only with interesting chemical and structural features, but mainly with a wide range of biological effects. The main sources of sesquiterpene lactones are the plants of the family Asteraceae (Compositae) and Apiaceae (Umbellate). Among the sesquiterpene lactones isolated from the plants of the family of Compositae, we found compounds possessing growth regulating, insecticidal, antifungal, antiparasitic, anti-inflammatory and antitumor activities. Currently, various growth stimulators are used in agriculture and they significantly increase the yield of different crops than organic and mineral fertilizers. In works [1-2], the regulating activity of a number of isoprenoids belonging to the group of sesquiterpenoids with different types of carbon skeleton is described. The results of the studies showed that sesquiterpenoids α -santonin (1), zerumbon (2) and C16-guaianolide (3) isolated from various plants increase the rice yield after one-day soaking of seeds in their solutions at 1:10,000 dilution as compared to the control by 14.17% (α -santonine, zerumbone) and 7.5% (C16 guaianolide).



1



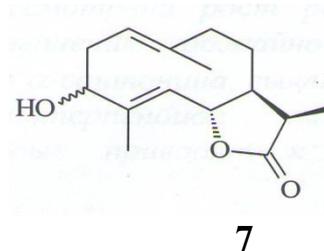
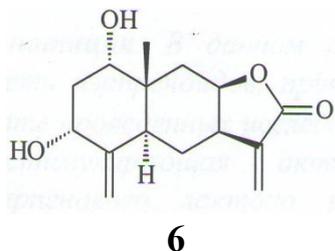
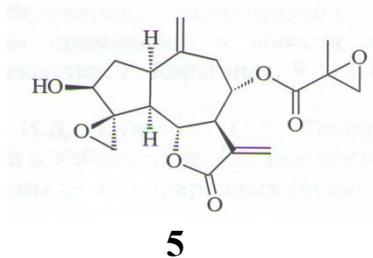
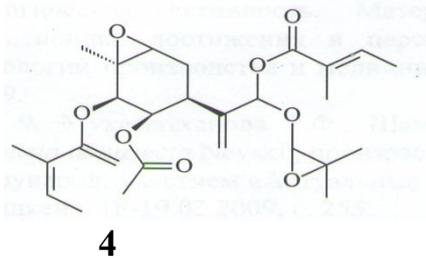
2



3

It should be noted that the aforementioned α -santonin (1) in major quantities is produced by plants of the genus *Artemisia* belonging to the subgenus *Seriphidium*

(Bess) Rouy. In connection with the foregoing, we examined the growth regulating activity of a number of terpenoids (including α -santonin) isolated from the flora of Uzbekistan. To consider the growth stimulating activity, the following procedure was used. A sample of terpenoid was dissolved in a small amount of alcohol and diluted with water to a volume ratio of 1:10000. Subsequently, the seeds were immersed in the resulting solution of each terpenoid for 24 hours separately. The yield was determined for dry weight and the results were compared with the control. As the results showed, the most active growth regulators were α -santonine (1), liganolide (4), repin (5), which significantly increased the rice yield by an average of 12.5%, and granulin (6) and artabine (7) – up to 10%.



In Uzbekistan, one of the most dangerous pests, causing huge damage to buildings and structures, including historical monuments of culture, are the Turkestan and the great Caspian termites. Chemicals used against termites currently have a temporary effect, since they have a short-term effect (no more than 3-5 days). In addition, due to growing problems related to the environment and health, many of them are completely banned. In this connection there is need to develop new methods and tools for termite control using toxic food baits of intestinal long-acting action killing termites for 40-45 days. Recent studies have shown that the most promising termicidal drugs are cyclic sesquiterpenoids produced by plants of the family *Asteraceae*, and *Apiaceae*. For example, American researchers (M. Tellez, W. Osbrink, M. Kobaisy *Sociobiology*, 41: 153-167 2003) found that the sesquiterpene lactone knicin with hermacrane type skeleton isolated from *Centaurea maculosa* and sesquiterpene ketone vulgaron B - from *Artemisia douglasiana* resulted in a high mortality rate among invasive termites. It was found that vulgaron B was lethal for termites with a rapid effect of exposure. On the fourth day after application, vulgaron B showed a 97% mortality rate. Knicin acted more slowly, and on the 15th day after the end it led to a 81% termite mortality. By the present time, as a result of our studies, a number of effective termicidal sesquiterpenoids of intestinal prolonged action from domestic flora have been identified, which, with individual application, result in 96-100% death of termites for 8-15 days of use. According to the above, deployment and expansion will lead to the creation of new highly effective pesticides that are harmless to humans and the environment.

