PHYTOSANITARY PEST RISK ANALYSIS FOR PSEUDOCOCCUS COMSTOCKI IN UZBEKISTAN

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Annotasiya: Ushbu maqola Pseudococcus comstocki haqidagi fitosanitar xavf tahlili tarqalishi, diagnostikasi, oldini olish, nazorat qilish va qo‘shimcha ma‘lumotlarni o‘z ichiga oladi.

Kalit so‘zlar: Fitosanitar xavf tahlili, tarqalishi, fitosanitar xavf, zararlanish.

Аннотация: В данной статье представлен анализ фитосанитарного риска (АФР) в отношении червеца Комстока (Pseudococcus comstocki Kuwana), являющегося опасным карантинным объектом. В исследовании проанализированы биология, ареал распространения, вредоносность и современные методы диагностики данного вредителя. Также разработаны практические рекомендации по предотвращению его завоза и распространения, совершенствованию системы фитосанитарного контроля и мерам борьбы с ним.

Ключевые слова: Pseudococcus comstocki, анализ фитосанитарного риска, карантин, распространение, диагностика, заражение, защита растений.

Abstract: This article presents a pest risk analysis (PRA) of the Comstock mealybug (Pseudococcus comstocki Kuwana), a dangerous quarantine pest. The study analyzes the biology, distribution range, damage potential, and modern diagnostic methods of the pest. Furthermore, practical recommendations are developed for preventing its introduction and spread, improving phytosanitary control systems, and implementing control measures.

Keywords: Pseudococcus comstocki, pest risk analysis, quarantine, distribution, diagnostics, infestation, plant protection.

Implementing ecologically safe Integrated Pest Management (IPM) measures against the Comstock mealybug involves utilizing all available pest population regulation methods. A primary and urgent task within this approach is to reduce pesticide application while sustaining cost-effectiveness, crop yield, and product quality.

IPM is a practice designed to enhance environmental quality; the primary advantage of such program frameworks relies directly on minimizing ecological footprints and environmental harm.

To design economically viable and sustainable IPM programs, several factors must be analyzed simultaneously: crop type, pest insects, diseases, natural entomophages, cultivation practices, and climate change dynamics.

Integrated Pest Management has emerged and evolved as an economically viable and ecologically sound approach to managing biotic stresses in crops, specifically targeting insects, diseases, weeds, and rodents.

IPM aims to minimize the risk of pesticide poisoning among farmers and reduce pesticide residues in food products for consumers. It is directed toward enhancing farm productivity, preserving biodiversity, and particularly improving the quality of natural resources such as soil and water.

IPM focuses on suppressing pest populations below the Economic Injury Level (EIL). To achieve sustainable crop production, it employs a variety of effective and environmentally safe pest control methods.

This Pest Risk Analysis (PRA) for the Comstock mealybug (*Pseudococcus comstocki*) encompasses pest identification, general overview, geographical distribution, affected species/host plants, diagnostics, biology and ecology, natural entomophages, impact evaluation, prevention/control measures, and supplementary data.

Reasons for conducting the pest risk analysis for this pest:

The rapid range expansion of the Comstock mealybug (*P. comstocki*) between 2020 and 2024, causing severe economic damage to agricultural production in newly infested territories.

Its status as an A2 internal quarantine organism widely distributed within the territory of the Republic of Uzbekistan.

Scientific Name and Taxonomic Position

Scientific Name: *Pseudococcus comstocki* (Kuwana) 1902

Taxonomic Position:

Domain: Eukaryota

Kingdom: Metazoa

Class: Insecta

Order: Hemiptera

Suborder: Sternorrhyncha

Superfamily: Coccoidea

Family: Pseudococcidae

Genus: *Pseudococcus*

Species: *Pseudococcus comstocki*

Synonyms: *Dactylopius comstocki* Kuwana, 1902

Common Names: Comstock mealybug

EPPO Code: PSECCO (*Pseudococcus comstocki*)

The Comstock mealybug (*Pseudococcus comstocki*) represents a well-defined taxonomic entity.

Geographical Distribution of the Insect

The Comstock mealybug is native to Japan and China. It was first described in 1902 by the entomologist S. Kuwana, who named the species in honor of the American entomologist J. H. Comstock. For many years, little information about this mealybug appeared in the literature. However, by 1920, reports regarding the emergence of new outbreaks began to surface in scientific publications. Currently, the Comstock mealybug is distributed across many countries in Asia, Africa, Australia, the Americas, and Europe. It is widespread throughout all Central Asian republics, including Georgia, Armenia, Azerbaijan, and Uzbekistan.

EPPO Region: Armenia, Austria, Azerbaijan, Bulgaria, Croatia, Czech Republic, France (mainland), Georgia, Germany, Greece (mainland), Hungary, Italy (mainland, Sardinia), Kazakhstan, Kyrgyzstan, Moldova, Morocco, Poland, Portugal (mainland, Azores, Madeira), Romania, Russia (Far East, Southern Russia), Serbia, Slovakia, Slovenia, Tunisia, Turkey, Ukraine, Uzbekistan.

Asia: China (Zhejiang), Japan (Hokkaido, Honshu, Kyushu, Shikoku), Kazakhstan, Democratic People's Republic of Korea, Republic of Korea, Kyrgyzstan, Lebanon, Nepal, Tajikistan, Turkmenistan, Uzbekistan.

North America: Canada (British Columbia, Ontario, Quebec), United States of America (Alabama, California, Florida, Georgia, Hawaii, Illinois, Kansas, Maine, Massachusetts, Michigan, Mississippi, Missouri, New Jersey, New York, Oregon, Tennessee, Texas, Washington)

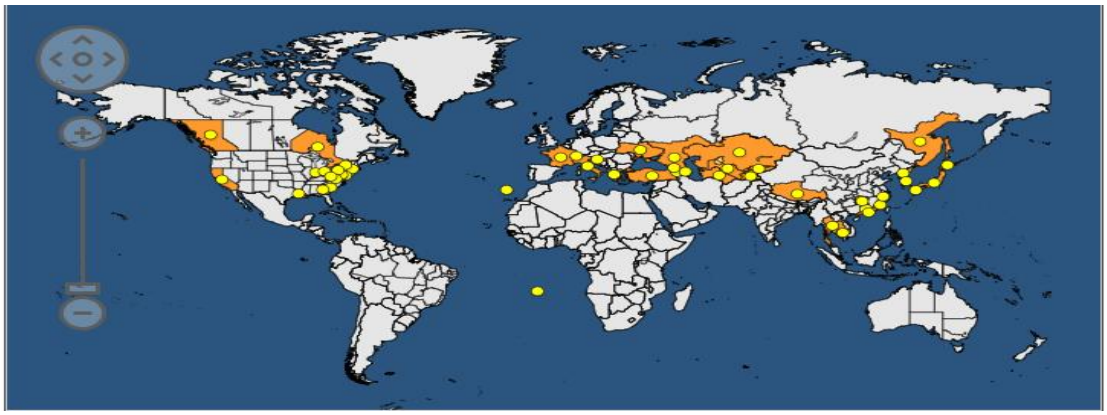

Figure 1. Global distribution status of the Comstock mealybug (Pseudococcus comstocki) according to EPPO data..

Phytosanitary Status

The Comstock mealybug was established as an A2 internal quarantine organism within the territory of the Republic of Uzbekistan in 1964. As of July 1, 2024, *Pseudococcus comstocki* (Kuw.) is recorded as widely distributed across all regions of the Republic of Uzbekistan.

Country/NPPO	List	Year addition	Year transfer	Year deletion
Africa				
Egypt	A2 list	2018		
Morocco	Quarantine pest	2018		
America				
Chile	A1 list	2019		
Mexico	Quarantine pest	2018		
Asia				
Israel	Quarantine pest	2009		
Kazakhstan	A2 list	2017		
Uzbekistan	A2 list	2008		
Europe				
Azerbaijan	A2 list	2007		
Belarus	Quarantine pest	1994		
Georgia	A2 list	2018		
RPPO/EU				
COSAVE	A2 list	2018		
EAEU	A2 list	2016		
EPPO	A1/A2 (formerly)	1975		1988

Figure 2. Global phytosanitary status of the Comstock mealybug (Pseudococcus comstocki) according to EPPO data.

Host Plant Range of the Comstock Mealybug

The primary host plants belong to the Rosaceae family, including apple, peach, pear, plum, and *Rubus* species. *Pseudococcus comstocki* has also been recorded on mulberry (*Morus*) in Japan (Gonzalez, 1989). Its host range is highly extensive, encompassing nearly 300 plant species across more than 40 plant families, including *Coffea*, *Cotinus* spp., *Elaeagnus* spp., *Malus*, *Morus* spp., *Populus*, *Pyrus*, *Prunus*, and *Vitis*. Within the EPPO region, these host plants are primarily cultivated as fruit crops and ornamental plants.

Host Plant List: *Alnus japonica*, *Berberis aquifolium*, *Camellia japonica*, *Carpinus betulus*, *Catalpa bignonioides*, *Celtis sinensis*, *Cotoneaster horizontalis*, *Ficus carica*, *Hedera helix*, *Hypericum calycinum*, *Litchi chinensis*, *Malus domestica*, *Morus alba*, *Morus nigra*, *Musa × paradisiaca*, *Pittosporum tobira*, *Platanus orientalis*, *Prunus laurocerasus*, *Prunus persica*, *Punica granatum*, *Pyracantha coccinea*, *Pyrus communis*, *Viburnum tinus*, *Vitis vinifera*, among others.

P. comstocki is a polyphagous species, and its actual host plant range may be broader than recorded. However, the insect cannot fully complete its life cycle on some of the reported plant species, indicating that these may not serve as true hosts. The economic significance of specific host plants varies considerably across different global regions. Consequently, localized literature sources provide the most accurate assessment for any given area. In general, this species poses a severe threat to deciduous fruit trees—including apple, pear, peach, plum, and currant—as well as certain woody ornamental plants. Different cultivars of fruit crops exhibit varying degrees of susceptibility worldwide, and numerous fruit varieties have been extensively studied in this regard.

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