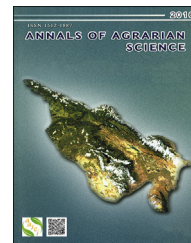


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Comparative study of Georgian breeds of mulberry silkworm according to the main biotechnological characteristics



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ABSTRACT

Efficiency of natural silk thread production is conditioned completely by high productivity of mulberry silkworm breeds and hybrids and by biotechnological characteristics of cocoon. Silk capacity is one of the most significant indices of breed productivity. Nutrition of Georgian breeds and hybrids of mulberry silkworm of Mziuri and Digmuri groups was performed in the Georgian Agrarian University, in the laboratory of sericulture, in spring seasons of 2012–2014. In the process of grain incubation and silkworm feeding the first day selection methods were used. Silk capacity, worm viability and cocoon yield were considered as the main signs for selection. Emphasis was made on the increase of silk capacity in further generations. At the nutrition of Mziuri and Dighmuri group mulberry silkworm breeds in 2012–2014 years, economic indices such as silk capacity and cocoon yield per gram worm have increased. At the nutrition of Mziuri and Doghmuri group breeds in similar conditions it became vivid that Dighmuri breeds are more resistant to diseases. To elevate viability and biotechnological characteristics it is necessary to carry out significant selection measures, application of blood refreshing method to overcome inbreed depression.

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Introduction

Mulberry silkworm (*Bombix mori* L.) is a very important insect not only for silk production but also as an object for various genetic, physiological, selection and biological experiments [1]. 90% of silk fabric manufactured in the world is of mulberry silkworm cocoon. Demand on silk raw material in the world is increasing annually, together with its production and therefore sericulture, as such is faced with a task to elevate productivity of mulberry silkworm breeds and hybrids.

Efficiency of natural silk thread production is conditioned completely by high productivity of mulberry silkworm breeds and hybrids and by biotechnological characteristics of cocoon. Silk capacity is one of the most significant indices of breed productivity. As is known, silk is synthesized completely in silk gland. There is a direct correlative link between silk gland mass and cocoon productivity. The bigger silk gland mass the high cocoon silk capacity. The mass of the silk gland increases especially intensely from the third to the eighth day of the fifth instar, that is, before cocoon twisting is started. Size and mass of the silk gland, in its turn,

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depends on the silkworm breed and age. Rate of the gland growth is especially intensified in the fifth instar. In the initial instar of the silkworm, gland mass equals to 4% of the worm mass, in the fifth instar it reaches 25–26%, while at this moment the gland length exceeds a worm length five times [2–6].

Area of mulberry silkworm possibilities which exerts decisive impact on the worm viability, metabolism, physiological and biochemical processes going on in the body, determines mulberry silkworm growth-development, that is silk gland development [7–11].

Objectives and methods

Nutrition of Georgian breeds and hybrids of mulberry silkworm of Mziuri and Digmuri groups was performed in the Georgian Agrarian University, in the laboratory of sericulture,

in spring seasons of 2012–2014. Grain incubation was performed by the method of permanent temperature. Mulberry silkworm feeding was implemented by the observance of all terms stipulated by agro rules fixed for moriculture and sericulture. In the process of grain incubation and silkworm feeding the first day selection methods were used. Silk capacity, worm viability and cocoon yield were considered as the main signs for selection. Emphasis was made on the increase of silk capacity in further generations [12–15]. Amount of nitrogen containing organic substances in mulberry leaf has great significance for qualitative and quantitative formation of silk mass, alongside with other terms [16].

Results

Live cocoon silk capacity was determined according to the average indices of cocoon made by 30 female and 30 male

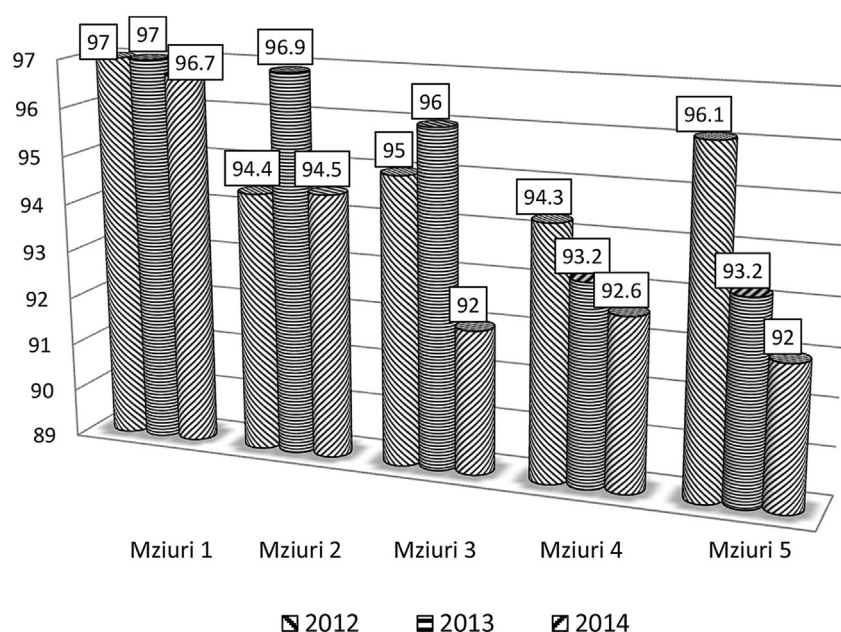


Fig. 1 – Viability of Mziuri group.

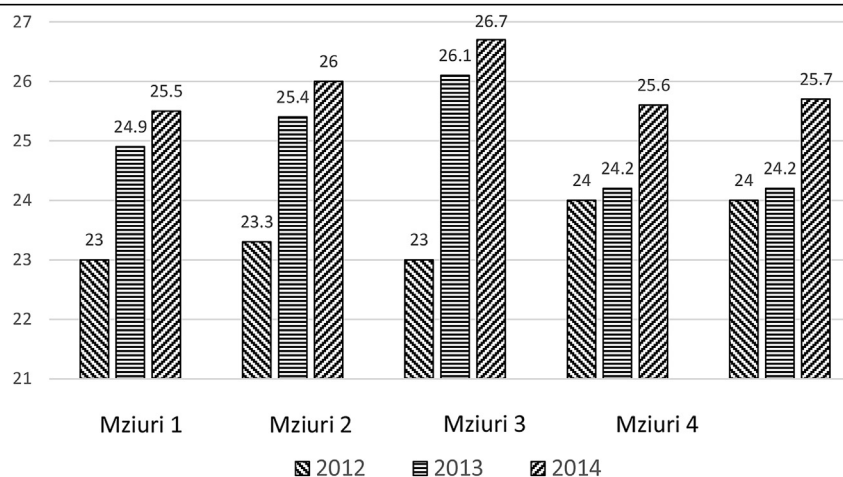


Fig. 2 – Silk capacity of Mziuri group.

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