

**EFFECT OF CERTAIN VERTEBRATE HORMONES
AND PLANT EXTRACTS ON BIOLOGICAL AND
ECONOMICAL CHARACTERS OF MULBERRY
SILKWORM, *Bombyx mori* L.**

By

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B.Sc. Agric. Sci. (Agric. Production), Fac. Agric., Cairo Univ., 1999

M.Sc. Agric. Sci.(Economic Entomology), Fac. Agric., Cairo Univ., 2008

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ABSTRACT

The present work aimed to study the effect of some vertebrate hormones and plant extracts on the egg parameters and encourage silkworm moths to increase the number of laid eggs, as well as economic characters of the silkworm, *Bombyx mori* L.

The obtained data revealed that, treatments with vertebrate hormones enhanced traits for the number of unfertilized eggs, number of fertilized eggs, number of unlaidd eggs, fecundity, fertility, coefficient of unlaidd eggs and hatchability.

In addition, vertebrate hormones increased the coefficient of laid eggs parameter. The increment range from 13,905 up to 34.550% for spraying application and ranged from 17.149 up to 34.605% for dipping application.

Also, using vertebrate hormones improved the economic characters of fresh cocoon weights, cocoon shell weight and cocoon shell ratio.

Using plant extracts *Ginseng* and *Achillea* improved the number of unfertilized eggs, number of fertilized eggs, number of unlaidd eggs, fecundity, fertility, coefficient of unlaidd eggs and hatchability.

Coefficient of laid eggs parameter was improved. The increment rate for spraying applications ranged from 16.787 to 35.011% for *Ginseng* and *Achillea* treatments. For dipping application it ranged from 18.659 to 34.773% % for *Ginseng* and *Achillea* extracts.

Also, using plant extracts *Ginseng* and *Achillea* enhancing traits of fresh cocoon and cocoon shell weight, cocoon shell ratio, the silk reelable filament length, weight and silk size.

Key words: Vertebrate hormones, plant extracts, mulberry silkworm, *Bombyx mori*, egg parameters, biological parameters, economic characters, technological parameters.

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INTRODUCTION

The silkworm, *Bombyx mori* L. is a monophagous insect that feeds only on mulberry leaves. The silkworm growth, development and metamorphosis are controlled by hormonal regulation.

Silk originating in the spittle of the silkworm larvae is a natural fibrous substance and is obtained from pupal nests or cocoons. The silk is preferred over all other types of fibres due to its remarkable properties like water absorbency, heat resistance, dyeing efficiency, and luster (Fenemore and Parkash, 1992; Ahmed and Muzaffar, 1987).

Silkworm breeding aims to achieve better performance for egg yield, cocoon & raw silk yield, cocoon crop reliability, cocoon and raw silk quality. Hybrids of three or four crossings are often used in order to overcome the high mortality and poor fecundity of the component pure lines for a hybrid (Anonymous, 1993).

A number of factors and events govern successful egg deposition, the principle ones being neural, hormonal, chemical, environmental, physical and behavioural factors which include mating, vitellogenesis, ovulation and oviposition, however, it is in the last stage that the substratum plays an important role in deciding the total number of eggs that will be laid where a suitable substratum encourages the female to deposit all the eggs formed in the ovarian follicles, while unsuitable one dissuades complete egg laying (Nangia and Ramakumar, 1997). It is a well known fact that silkworm moths lay around 58 - 65 % of all eggs formed in the ovaries while a percentage

of 35 - 42 % of the eggs are not laid which is considered a great loss of egg yield (El-sayed *et al.* 1996; Hugar *et al.* 1997 and El-Hattab, 2002).

Fecundity and fertility of the *Bombyx mori* L. female are two major factors in silk industry because these are directly correlated with silk-production Faruki, 2005. The increased level of estradiol in the haemolymph of larvae treated topically with a vertebrate sex steroid indicated effective penetration of this hormone through the larval cuticle Keshan and Ray, 2000.

Recently, the use of vertebrate hormones to enhance the commercial characters of the mulberry silkworm, *Bombyx mori* L., has taken a great turn. (Saha and Khan, 1997).

Testosterone is a hormone responsible for many of the physical characteristics specific to adult males. It plays a key role in reproduction and the maintenance of bone and muscle strength. It produced by the gonads (Leydig cells in testes in men and by the ovaries in women), although small quantities are also produced by the adrenal glands in both sexes. It is an androgen, meaning that it stimulates the development of male characteristics. Present in much greater levels in men than women, testosterone initiates the development of the male internal and external reproductive organs during foetal development and is essential for the production of sperm in adult life. This hormone also signals the body to make new blood cells, ensures that muscles and bones stay strong during and after puberty and enhances libido both in men and women (Mason , 2004).