

## A Study on Cotton (*Gossypium* sp.) Nectar Production in Uzbekistan

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**Abstract:** Given the importance of cotton varieties in beekeeping, we have been able to determine the nectar and honey yield per hectare for several years Cotton nectaries produce highly concentrated carbohydrates, nectarines, amino acids and fatty acids. Unlike other types of plants. In different varieties of cotton, there are 4 types of nectaries (intra-cup, bract, sub-bract, and leaf), and the number and concentration of nectarium are different for all types. Nectar productivity of fine fiber varieties is significantly higher than that of medium fiber varieties. Nectar is an important nutrient source for insects and pathogens due to its high sugar content. Several methods of nectar determination were used to determine the number of angles of cotton varieties planted in the country, such as "tube" and "washing." On average, honey yield of these varieties is 50-60 kg per hectare. It is understood from the research results that cotton varieties have high honey and nectar productivity in Uzbekistan environment.

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## 1. INTRODUCTION

Cotton (*Gossypium* sp.) is an important source of feed for beekeeping farms in Uzbekistan. Because currently the main source of beekeeping honey is cotton fields, along with natural flora. However, the data on the cotton crop is not quite complete. Also, many new varieties of cotton have been released lately and the amount of wreaths has not been determined. Therefore, this issue is of great importance both in cotton growing and beekeeping. Despite many scientific observations and experiments, so far there is no consensus on the amount of cotton flower juice in science. It is known that nectar extinction is a complex biological process that is influenced by climatic conditions of the year and by anthropogenic factors. Although cotton has been planted since ancient times, its "originality" has only been relatively recent. At first it was not known whether cotton produced nectar or not. Beekeeping was observed later in the cotton flowers. It is determined by the yield of the flower [1- 3].

Kaziev's research shows that the yield of cotton in the conditions of Azerbaijan in 1964 is 26-37 kg. [4]. According to SG Minkov [5], in South Kazakhstan each flower produces honey 8-11 mg and its honey yield is from 11 to 33 kg per hectare. Also, the amount of cotton wool

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was calculated in Bulgaria and Egypt. According to their data, in each of these countries each flower produces 8-12 mg from rose. Their honey yield ranges from 20 to 30 kg [6].

Cotton nectaries produce highly concentrated carbohydrates, nectarins, amino acids and fatty acids [7, 8]. Nectar is an important nutrient source for insects and pathogens due to its high sugar content [9-12]. Cotton nectar attracts insects beneficial for pollination and protection, which enable the plants to achieve greater reproduction [13].

## 2. MATERIAL and METHODS

Objects of the research are the following cotton varieties: cotton "Namangan-77", created by VA Avtonomov, M. Saidakhmedov, A. Egamberdiev and others at the Scientific Research Institute of Agrotechnologies of Crop Breeding and Breeding. The average growth period is 100-120 days and included in the State Register since 2012. Sh.Namazov, N.Khojambergenov and others at the Sulton Scientific Research Institute of Crop Breeding, Seed Breeding and Agro-Technology. The ripening period is 115-120 days on average and has been included in the state register since 2011. "Andijan 35" was developed by T.Komilov and others at the Andijan scientific experimental station of the Scientific- Research Institute of Crop Breeding, Seeding and Breeding Agrotechnology. The ripening period is 122–255 days on average and is included in the 2006 State Register.

Several methods of nectar determination were used to determine the number of angles of cotton varieties planted in the country, such as "tube" and "washing." The tube technique is simple and easy to use and has been used by many people. The number of angles determined by the tube method is as follows. Glass tubes of 0.1-0.3 mm in diameter and 4.5 cm in length are manufactured. They are weighed on accurate weights and weighed. These tubes are transmitted between plant florets and extracted from the juice. It will be weighed again. Of course, the number of flowers and what candies are derived. The amount of sugar in the rose (in percentage) is determined by the refractometer. The second method is the "washing" method where distilled water is poured into specially prepared tubes (40 cm<sup>3</sup>). These vials are given a certain amount of flowers. The filtrate is shaken for 20-25 minutes when the juice from the flowers is transferred to the vial. The filtrate is analyzed by the Hagedorn and Jensen [14] method in the chemical laboratory.

## 3. RESULTS and DISCUSSION

Cotton blooming in Uzbekistan lasts from early July until late autumn, and slower flowering lasts from mid-July to late August. Vegetation buds begin to open at 8-9 am, slopes begin at 10 am and last until the evening. As you know, all of cottons produces nectar. According to our observations, the intensity of the hernia separation lasts from the morning to the middle of the day. In a study, Gilliam et al. [15]. Floral nectar from 3 cultivars of field-grown cotton, 9 cultivars of cotton grown in a greenhouse, 5 cultivars of citrus, saguaro cactus, and prickly pear cactus were examined for bacteria, yeasts, and molds by plating on selective microbiological media. No microbes were isolated from nectar of any cotton flowers. Of 23 samples of citrus nectar, 3 contained a few gram-negative rod-shaped bacteria. Nectar from prickly pear cactus contained no microbes, although nectar from saguaro cactus contained a few bacteria (gram-negative rods, gram-positive rods, and gram-positive cocci). These results are discussed in relation to possible antimicrobial substances in nectar as well as the origin of the microflora of honey bees.

To our knowledge, the amino acids in the floral nectar of cotton (*Gossypium* spp.) have not been determined, although Clark and Ulkefahr [16], using paper chromatography, failed to find amino acids in *Gossypium* extrafloral nectar. However, Mound [17] detected two ninhydrin-positive substances on paper chromatograms of extrafloral nectar from *G.*

*barbadense* L., and Hanny and Elmore [18], using both gas and thin layer chromatography, found 24 free amino acids in extrafloral nectar of *G. hirsutum* L. Yokohama [19], without giving data, stated that she found a high concentration of amino acids in extrafloral nectar of *G. hirsutum*.

Given the importance of cotton varieties in beekeeping, we have been able to determine the nectar and honey yield per hectare for several years (Table 1). It was found that the amount of nectar in each flower ranges from 8-10 to 30-36 mg. The amount of honey per hectare is 30-50 kg and honey yield is 15-20 kg to 30-40 kg.

**Table 1.** Nectar productivity of different medium fiber varieties.

No	Cotton varieties	The amount of nectar per flower (mg)	Nectar productivity kg/hectares	Honey product kg/hectares
1	Bukhora-102	26.10 ± 3.40	33.47	24.85
2	Andijan-36	11.75 ± 1.34	35.60	16.20
3	C-8286	10.32 ± 1.16	30.04	15.71
4	C-6524	9.66 ± 1.13	25.92	16.10
5	C-9063	12.66 ± 1.81	33.04	21.10

From the above, it can be seen from the fact that mid-fiber varieties are an important nectar-honey source for beekeeping farms. Therefore, all cotton plantations should be used on time. The nectar extraction of the pellets of cotton (Table 2) differs from each other. As shown in the table, the most widespread of medium-fiber varieties are produced by shellfish (74%), while others range from 3% to 14%. At the same time, the abdominal cavity accounted for 84%, and at least the leaflet (1.18%).

**Table 2.** Sugar yield of different types (%)

No	Part	Sugar contents (mg)	
		Medium fiber varieties	Varieties of fine fibers
1	Inside the flowerpot	25.9 (74%)	54.90 (84%)
2	Underneath the skull	3.15 (9%)	6.94 (11%)
3	In front of the flowerpot	5.08 (14%)	2.00 (3%)
4	On the leaf	1.12 (3%)	1.18 (2%)
5	Total	35.25 (100%)	65.02 (100%)

The most productive of cotton candy is the pearl inside the turquoise. Based on this, we have identified the dynamics of the wreath, which is separated by the apple tree in the flowerpot: (Table 3). Cotton plants present a relevant model system for comparing the defence strategies against herbivores [20]. While a lot of research has been carried out about the biochemical mechanisms underlying VOC emission in cotton plants and their associated beneficial interactions with insects [21], very little is known about the role of nectar [22]. Results of Llandres's study showed that wild cotton varieties produced a greater quantity of nectaries and this nectaries enhanced the diversity of natural enemies. The amount of nectar excreted by the entrails also varies. Accordingly, the number of bees that visit them varies. In another study, Özkök and Silici [20] performed biological analyses of different honey samples (chestnut, citrus, clover, cotton and sunflower). According to their results, cotton honey has  $38.99 \pm 5.08$  mg GAE/100 g sample total phenolic content, and also it possesses  $139.95 \pm 4.52$  mg AAE/g sample antioxidant activity and  $6.67 \pm 0.42$  antiradical activity [23]. As noted earlier, nectar and honey yield of fine fibers is much higher than that of medium-fiber varieties. It is reported that the honey yield of the previously planted and cultivated fine-fiber varieties in the country

ranges from 43.68 kg to 100 kg/ha. The most productive varieties are Bukhara-1, Termez-7. The S-6040, Surxon-2 can be cited. On average, honey yield of these varieties is 50-60 kg per hectare.

**Table 3.** The process of separation of the wreath by the giraffe inside the turquoise

Time	Air temperature (°C)	Varieties					
		Namangan-77		Sulton		Andijan-35	
		Nectar content (mg)	Nectar concentration (%)	Nectar content (mg)	Nectar concentration (%)	Nectar content (mg)	Nectar concentration (%)
7	24	1.80 ± 0.21	20	0.30 ± 0.06	15	1.33 ± 0.18	43
9	27	12.32 ± 3.12	22	2.22 ± 0.45	30	3.66 ± 0.48	43
13	36	46.00 ± 7.18	30	8.50 ± 1.19	42	7.33 ± 1.10	50
15	35	11.00 ± 2.71	35	10.00 ± 1.31	45	13.66 ± 3.14	53
17	35	7.03 ± 0.94	45	10.50 ± 1.32	47	12 ± 3.12	52
19	32	7.00 ± 0.94	45	8.00 ± 1.12	47	9.20 ± 1.29	53
Aver		10.18	31.71	6.24	37.54	5.02	47

#### 4. CONCLUSION

In conclusion, it is important to note that cotton varieties sown in all regions of Uzbekistan are an important source of nutrition for beekeeping farms. Cotton nectar attracts insects beneficial for pollination and protection, which enable the plants to achieve greater reproduction. According to our observations, the intensity of the hernia separation lasts from the morning to the middle of the day. At the same time, timely pollination of cotton varieties with bees is an important factor in increasing their productivity.

#### Declaration of Conflicting Interests and Ethics

The authors declare no conflict of interest. This research study complies with research publishing ethics. The scientific and legal responsibility for manuscripts published in IJSM belongs to the author(s).

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