

DYNAMICS OF STORAGE OF ALKALOIDS IN *A. DONAX L.* PLANT

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Abstract. The results obtained from the samples of *A. donax L.* plant raw materials collected from the eight regions of the Republic of Uzbekistan in different growth periods were presented. When the alkaloid content of *A. donax L.* was analyzed depending on the place of growth, it was found that the amount of alkaloids in the plant differed both quantitatively and in the composition of individual components depending on the composition of the root, vegetation period and conditions.

Keywords: *A. donax L.*, alkaloids, extraction, dynamics of alkaloid storage.

Introduction

Arundo donax L. reed [1], or giant reed (lat. *Arundo donax*) - belongs to the family of flowering plants belonging to the arundo family (*Poaceae*). A perennial plant up to 6 m tall. The stem is straight, 1-3.5 cm in diameter. Joint spaces are thickened. The plant produces thick, woody rhizomes. Each leaf is clearly divided into two linear parts by the main vein. Leaves are linear 30-60 cm, width 1-8 cm. The plant is 5-7 m tall, depending on the growing conditions can grow [1].

Materials and methods

We took 60 grams of crushed *A. donax L.* plant and moistened it with 45 ml of 8% ammonia solution. After 2 hours, we placed it in a soxhlet apparatus connected to a reflux condenser, poured 500 ml of chloroform on it and started chloroform extraction. We continued the extraction for 8 hours. 50 ml of 10% sulfuric acid was added to the concentrated extract by expelling 3/2 of the chloroform by expelling the sum of alkaloids with chloroform in the flask. We repeated this several times.

We added 15 ml of 25% ammonia to the acidic solution and brought the medium to pH 8-9. Wash the resulting alkaline solution with chloroform as above. We continued this process 8 times. For this, 400 ml of chloroform was used. Alkaloids with chloroform were isolated by distillation. Alkaloids remaining in the flask were dried using a water pump.

Aluminum oxide and silica gel 150/200, KSC from Tianjin Sinomed Pharmaceutical (China) and Sephadex LH-20 from GE Healthcare Bio-Sciences AB (Sweden) were used for column chromatography.

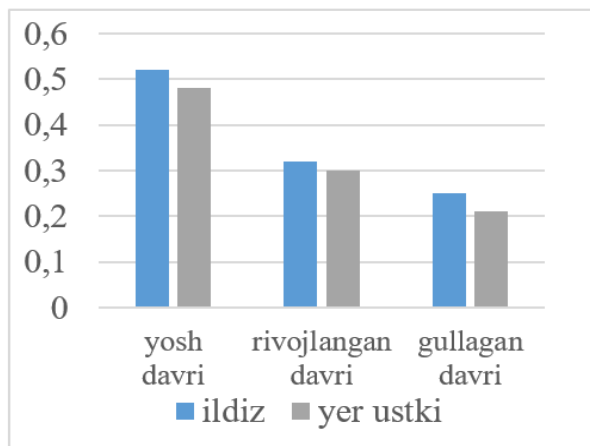
Result and discussion

Data on the qualitative and quantitative composition of alkaloids isolated from *A. donax L.* are presented in diagrams 3.1-3.8. These diagrams show the results obtained from samples of plant raw materials collected in different growth periods from eight regions of our Republic.

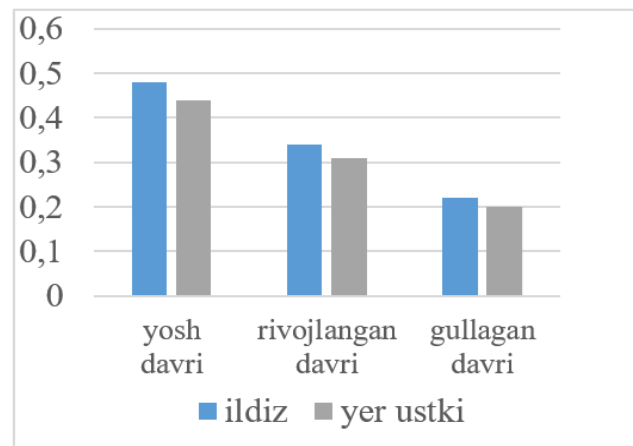
1. The age of the plant is 15-0.30 m.
2. The period of development of the plant is 1-1.5 m.
3. The flowering period of the plant is 3-5 m.

When the alkaloid content of *A. donax L.* plant is analyzed depending on the place of growth, the plant depends on different growth places, root composition, vegetation period and

conditions. It was found that the amount of alkaloids in the composition differs from each other both quantitatively and in the composition of individual components [4-5].

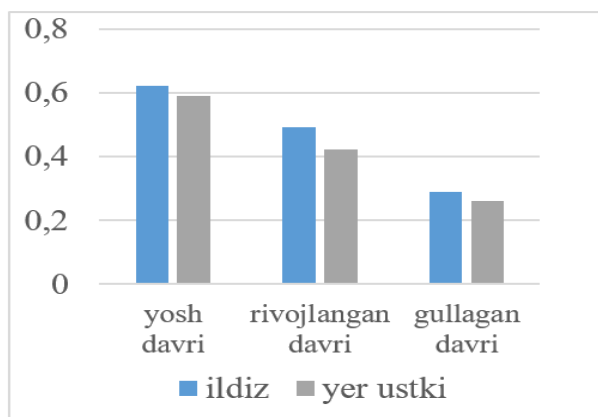


3.1-diagramma: Xorazm viloyati Yangi ariq tumani Ostona qishlog'i

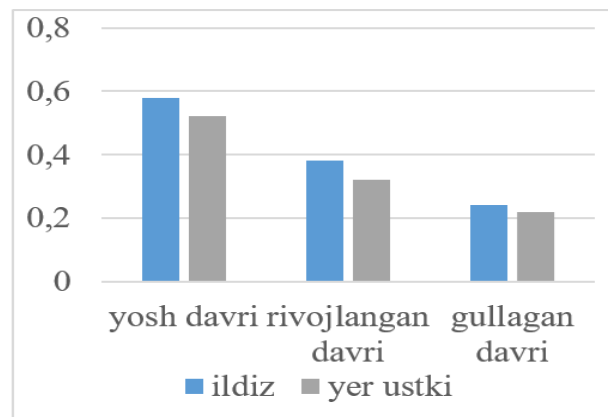


3.2-diagramma: Toshkent viloyati Yangi yo'l tumani Qo'shyog'och qishlog'i

The obtained results made it possible to extract the alkaloids of the plant according to the amount of total alkaloids in different vegetation periods and different organs, and the dynamics of the accumulation of individual alkaloids. The study of the amount of alkaloids by the vegetation period of the plant showed that the maximum accumulation of alkaloids occurs in the initial period of plant development [6]. As the plant grows, the amount of total alkaloids in the surface and root parts gradually decreases [7].



3.3-diagramma: Namangan viloyati Chust tumani Olmos qishlog'i

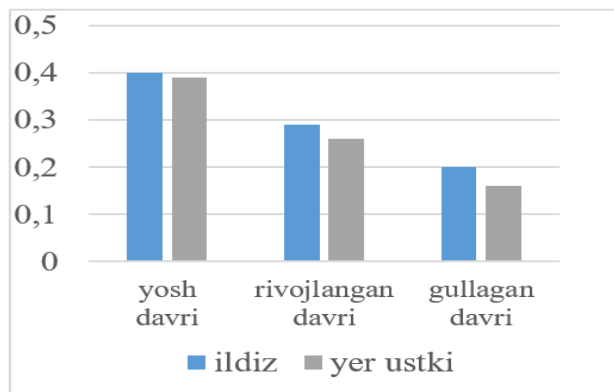


3.4-diagramma: Namangan viloyati Pop tumani Chodak qishlog'i

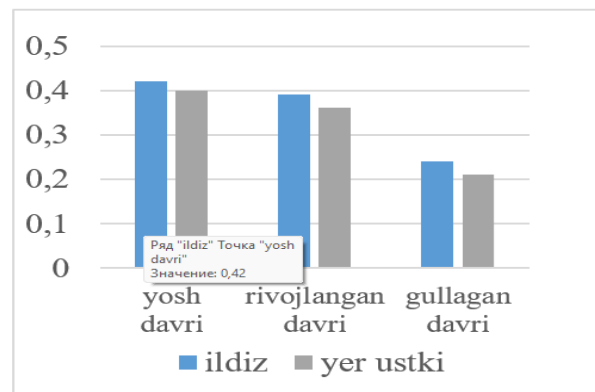
Donaxin is the main alkaloid of the above-ground part of *A. donax L.* plant in all growing areas, and its amount is 38% compared to the sum of alkaloids. This alkaloid is almost not found in the root. The main alkaloid of the root is arundamine, its amount is 14-19% of the total alkaloids. As the plant grows, it was observed that the sum of alkaloids and the amount of main alkaloids decrease.

Khorezm Region, Yangi Arik District, Astana Village (diagram 3.1), Tashkent Region, New Yol District, Koshyogoch Village (diagram 3.2), Fergana Region, Altiariq District, Borbalik Village (diagram 3.8) alkaloid storage percentages of plants growing in the area and structurally very close to each other. When the plant samples of Alchaali village, Kurgantepa district, Andijan region (diagram 3.7) were studied, it was observed that the amount of alkaloid arundamine, the main alkaloid of the underground part, decreased [9.10]. A similar situation in the village of Yangi

Bo'ston, Yoziyovon district of Fergana region (diagram 3.5), New village, Dangara district of Fergana region (diagram 3.6), Olmos village of Chust district of Namangan region (diagram 3.3), was also observed in the samples of Chodak village, Pop district, Namangan region (diagram 3.4).

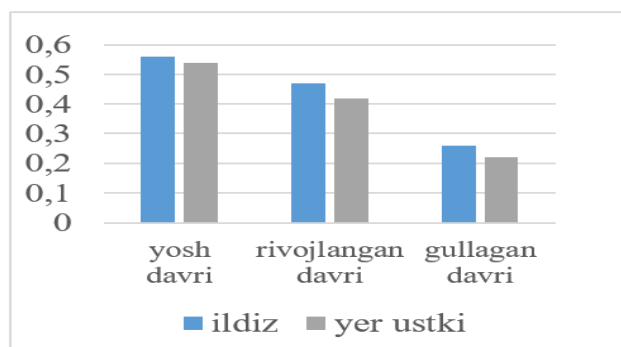


3.5-diagramma: Farg'ona viloyati Yoziyovon tumani Yangi Bo'ston qishlog'i

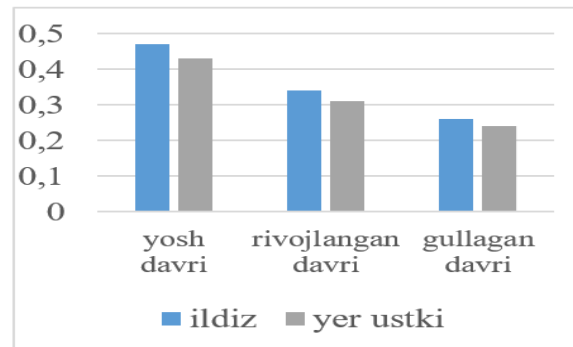


3.6-diagramma: Farg'ona viloyati Dangara tumani Yangi qishloq MFY

The analysis of alkaloids content of plant samples of , Yangi Boston village, Fergana region, Yoziyovon district, Dangara district, Fergana region, showed that the amount of arundinine in the above-ground part of the plant increased relatively. It was found that the amount of arundavine and arundafine in underground alkaloids increased [11.12]. For the first time, this condition was observed in the samples of Yoziyovon district.



3.7-diagramma: Andijon viloyati Qo'rg'ontepa tumani Alchaali qishlog'i



3.8-diagramma: Farg'ona viloyati Oltiariq tumani Borboliq qishlog'i

With the assumption that this is related to the composition of the soil, the composition of alkaloids was collected from the plant samples of , New Village, Dangara District, an area with similar soil composition. The results of the comparison showed that the alkaloid composition of both samples is similar. It can be concluded that when a plant grows in unfavorable conditions (soil content is sandy and salty), its alkaloids content changes.

If we compare this situation with the samples of Olmos village, Chust district, Namangan region, and Chodak village, Pop district, Namangan region, it was found that the percentage of alkaloid retention of the plant in the young period is higher than in other regions. In our opinion, plant growth becomes difficult in the mountainous area due to the reduction of plant biomass, and the plant produces more protective means in fertile or unfavorable conditions.

In conclusion, it can be said that the quantitative and qualitative composition of alkaloids in different vegetation periods of naturally growing *A. donax* L. plant samples from the place of growth were studied and compared with each other.

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