

## CHEMICAL COMPOSITION OF CYNARA SCOLYMUS L. AT DIFFERENT VEGETATIVE PHASES

**E. E. Isomov**

Teacher of Samarkand branch of Tashkent State Agrarian University  
[eldor\\_isomov@mail.ru](mailto:eldor_isomov@mail.ru)

**Z. B. Nomozova**

Samarkand State University, University Boulevard, 15 Samarkand Uzbekistan  
[znomozova@mail.ru](mailto:znomozova@mail.ru)

### ABSTRACT

*C. scolymus* L. is used as nonconventional valuable medicinal and food plant in Uzbekistan. Chemical composition of green and dry biomass was identified at the beginning of growth, budding, flowering, and fruiting periods of the plant.

**Keywords:** chemical composition, forage plants, growth, development, yield.

### INTRODUCTION

Exploration and introduction of any new forage plant into a new region first of all requires studying its fodder qualities, i.e. chemical composition of green biomass and nutritional potential of organic substances of the plant. *C. scolymus* L. is used as nonconventional valuable medicinal and food plant in Uzbekistan. Liquids extracted from its inflorescences, flowers, leaves and roots can be widely used for treatment of numerous diseases connected with kidney, digestive system, liver pathology (hepatitis, cholecystitis and others), diuretic problems [Lavrenov and Lavrenova, 2006]. The plant is also reported rich in nitrogen (2.5%) and sugar (1.0-2.2%) substances, dextrin (2%), fiber (1.3%) and ash (1.3%) which indicates on its high potential as a forage plant. In this paper I present the results of research on studying the fodder properties of *Cynara scolymus* L. introduced in the condition of Samarkand region in Uzbekistan.

### MATERIALS AND METHODS

Cultivation of *C. scolymus* was performed in the condition of no irrigation in sierozem soils in Samarkand region. Chemical composition of green and dry biomass was identified at the beginning of growth, budding, flowering, and fruiting periods of the plant. Nitrogen,

protein, carotene, inulin, fiber, fat and ash were determined according to Alikaev et al. [1982]. To study the amount of phosphorus and micro and macro-element was conducted using the method proposed by Lukashik and Tashilin [1976].

## RESULTS AND DISCUSSION

As experimental results showed that in the condition of no grazing *C. scolymus* contains relatively high amount of crude protein (16.0%) at the budding and fat (3.20-4.14%) at flowering stage. In contrast to this, low amount of crude protein (12.10-11.3%) was observed at the beginning of growth and fruiting period, and fat (2.11%) at flowering period.

Amount of primary vitamin A – carotene occurs mostly in the leaves of the plant. Accumulation of carotene in chloroplasts varies depending on the chlorophyll content and actively takes part in photosynthesis. Accumulation of the carotene with an amount of 115.47 gr. in its dry biomass was observed in Tajikistan [Sinkovskiy et al., 1974]. In case of Uzbekistan. I identified that amount of carotene content is variable during the growth period. Highest amount of carotene (378.1 mg/kg) was recorded at flowering period and the least amount (136.7 mg/kg) at the beginning of the growth period. The dynamic of sugar had identical trend being high at flowering (11.5%) and low (6.01%) at the beginning of growth period. *C. scolymus* is frost tolerant and thus its leaves stay green under the snow. Accumulation of high amount of carotene and sugar in leaves formed in late autumn increases frost tolerance of the plant.

Results on the content of mineral element in *C. scolymus* showed that highest amount of calcium (14.6-17.2 gr/kg) and phosphorus (1.29-1.12 gr/kg) was observed during budding and flowering periods, but at the beginning of the growth their content is decreased being 10.32 gr/kg of calcium and 0.62 gr/kg of phosphorus. High amount of magnesium (10.1 gr/kg) and potassium (21.4 gr/kg) was also recorded at the fruiting and flowering periods, respectively. The amount of sodium was highest during budding and flowering periods (4.20-6.15 gr/kg) and decreased during fruiting period (1.55 gr/kg). As results showed that high content of micro and macro elements in the composition of *C. scolymus* clearly indicate on its high fodder qualities.

Experimental results also showed that *C. scolymus* contains important microelements as Cu, Fe, Mn, Zn for organisms of livestock. Highest amount of copper was 16.20-16.50 mg/kg at flowering and fruiting and the lowest (8.25 mg/kg) at the beginning of growth period.

Accumulation of manganese (73.5 mg/kg) at flowering, and zinc (46.6-51.7 mg/kg) at flowering and fruiting periods was observed.

## CONCLUSION

Based on the obtained results we can conclude that *C. scolyumus* in term of its chemical composition can be considered as perspective fodder plant with high nutritional value along the conventional rangeland plants. Thus, cultivation of this plant is of high economic importance in the condition of Uzbekistan.

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