Short Reports

STRUCTURE OF ASTRAGALUS SULCATUS L. (FABACEAE) POPULATIONS

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The article provides data on onthogenetic structure of natural populations of *Astragalus sulcatus* L. (*Fabaceae*) that is rare in steppe and forest-steppe areas of Russia. Numbers of specimen can vary by years, populations can be nature or aged normal incomplete with interrupted one-peak right-side onthogenetic spectre.

Preservation of vegetative surface requires a careful study of specific specimen among rare kinds of plants. Such works obtain a special importance in formation of regions' Red book. A significant number of kinds require protection in Samara region [1–4]. Variety of the flora in this region is defined by its location in two natural areas – steppe and forest-steppe.

We have undertaken a study on population structure of *Astragalus sulcatus* L. (*Fabaceae, Leguminosae, Papilionaceae*). During the work we used population-onthogenetic methods of collecting and processing data that have become traditional and are based upon discrete description of onthogenesis among model specimen and definition of vitality among specimen and natural populations. Onthogenesis of this astralag was studied in Penza region (Russia) [5]. The kind is widely spread in Europe, Siberia, Middle and Central Asia. It is a many-ears grassy plant scape-root plant. Protected in certain regions of Russian Federation (for example, Voronezh, Samara, Tambov region). Majority of populations count a small number of specimen. Grows in meadow and steppe communities on various types of soils (from salted to carbonate). Emergence of germs is complicated by presence of solid rind on seeds [1, 5].

It has been established that in terms of low strain or lack of it *A. Sulcatus* is presented in mature normal incomplete populations with interrupted single-peak centered specter with maximum at mature generative plants (31%). No senile specimen were registered in populations. Generative core is presented among 76% of specimen. Anthropogenic transformation of soil-vegetative surface provides for transition of population to aging normal incomplete with interrupted single-peak right-side specter with maximum at aged generative specimen (35%). Besides, as in the previous case, left part of onthogenetic specter (from germs to virginile condition) falls out completely. Generative specimen are presented among 86% of samples. Basic onthogenetic specter for the studied cenotic populations is also incomplete with prevalence of mature generative specimen (about 40%), a high position is occupied by plants with aged generative group (almost 24%), generative core forms about 78%. Germs and juvenile plants were not registered in the studied populations, and it is explained by transience of onthogenetic condition, catastrophic death among young specimen, and period of observation (July-August). No doubt, additional research on astragal population will be required at the moment of teenager emergence from seed bank. Spatial location of specimen in kind populations is random, plants can be distanced significantly from each other, large accumulations of specimen were not registered.

During the period of observing natural populations, we have established that number of kind specimen varies in years; the following factors limit development of specimen and their populations: ploughing of territories, hay cutting, steppe fires, unlimited cattle pasture, and also special features of ontho- and morphogenesis; populations of kind with low vitality level and prevalence of generative specimen, reproduction of specimen is insufficient to sustain permanent numbers in populations, specimen density is low; in separate seasons specimen do not fixate, obviously, being in idle condition.

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THE INFLUENCE OF THE HORMONES OF EPIPHYSIS TO THE REPRODUCTIVE SYSTEM

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Epiphysis is a small endocrine gland in the vertebrate brain. Also it known as pineal gland, also

the pineal body because the shape of the gland resembles a pine cone. Epiphysis is located in the epithalamus, near the center of the brain, between the two hemispheres, tucked in a groove where the two halves of the thalamus join.

The pineal body consists in humans and mammalians of a lobular parenchyma of pinealocytes surrounded by connective tissue spaces. The gland's surface is covered by a pial capsule. The pineal gland consists mainly of pinealocytes, but four other cell types have been identified. As it is quite cellular (in relation to the cortex and white matter). The pinealocytes consist of a cell body with 4–6 processes emerging. They produce and secrete melatonin. The pinealocytes can be stained by special silver impregnation methods. Their cytoplasm is lightly basophilic. With special stains, pinealocytes exhibit lengthy, branched cytoplasmic processes that extend to the connective septa and its blood vessels. Interstitial cells are located between the pinealocytes. They have elongated nuclei and a cytoplasm that is stained darker than that of the pinealocytes.

Melatonin (***N***-acetyl-5-methoxy tryptamine) is a serotonin derived hormone which modulates sleep patterns in both circadian and seasonal cycles. Melatonin is a hormone that is produced by the pineal gland in animals and regulates sleep and wakefulness. Melatonin is also produced in plants where it functions as a first line of defense against oxidative stress. Nearly all vertebrate species possess a pineal gland. *Branchiostoma lanceolatum*, the nearest existing relative to vertebrates, also lacks a recognizable pineal gland. The lamprey (considered almost as primitive as the hagfish), however, does possess one. A few more developed vertebrates lost pineal glands over the course of their evolution. The human pineal gland grows in size until about 1–2 years of age, remaining stable thereafter, although its weight increases gradually from puberty onwards. The abundant melatonin levels in children are believed to inhibit sexual development, when puberty arrives, melatonin production is reduced.

Materials and methods. Scientific examinations is conducted in the veterinary laboratory of Russian Institute of hunting and farming, Kirov region with red fox which belongs to breeding fur farm "Vyatka". Two groups of the foxes is organized: control group (7 animals) and the experimental group (7 animals). The experimental groups were injected subcutaneously in the interscapular region by melatonin-retard (melakril) in the dose of 10 mg per 1 animal. In the control group, this drug was not injected. The samples of the ovaries were fixed in the 5% solution of formaldehyde. Making of paraffinic histological slices with thickness 5–7 mkm is conducted with standard methods of G.A. Merkulov [4].The slices were coloured by Mayer`s hematoxilin and eosin. The digital material is made by statistic methods with using the program "Biostat". Reliability of the results is valued by Student`s criterium.

Results. At morphological examination of ovaries the primordial, the primary and the secondary follicules, tertiary follicules the atretic bodies and the yellow bodies were found. In control group atrophy of the ovaries with excrescence of connective tissue in the stroma and the absence tertiary follicules and atretic bodies were noticed. At morphometric examination of the ovaries of the red foxes in the experimental group the square was more 2.25 times in comparision with the control, the quantity of the premordial follicules was more 2.4 times, the primal - 2.8 times, the secondary – 2.4 times, the yellow bodies – 11 times. Morphometric and morphologicacal parametres of the foxes before and after the melakril injections differed in experimental and control group: first of all square of the ovaries in experimental group were 21006,6 mkm; in 9302 mkm.

Calcification of the pineal gland is typical in young adults, and has been observed in children as young as two years of ag [2]. The calcified gland is often seen in skull X-Rays [2, 3]. Calcification rates vary widely by country and correlate with an increase in age, with calcification occurring in an estimated 40% of Americans by their 17th year. [1, 2] Calcification of the pineal gland is largely associated with corpora arenacea also known as "brain sand". Calcium, phosphorus, [1] and fluoride deposits in the pineal gland have been correlated with aging, showing that, as the brain ages, more deposits collect. By old age, the pineal gland contains about the same amount of fluoride as teeth.[2] Pineal fluoride and pineal calcium are correlated. It seems that the internal secretions of the pineal gland inhibit not only the development of the reproductive glands but also them degenerations.

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