

# **LARGE-SCALE SPATIAL CORRELATION BETWEEN MULTIANNUAL FLUCTUATIONS IN SOME TERRESTRIAL BIOLOGICAL PROCESSES MAY BE EXPLAINED BY EXOGENOUS DRIVING FACTORS**

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The comparative analysis for running of long-term multiannual time-course of some biological processes between remote sites, sweeping the northern cap of Earth, is carried out on the conceptual base of chronobiology (Halberg et al., 2000) which suggests the taking into consideration the geoheliophysical environment. The option of sites was restricted by available long-term monitoring data bases which were as follows: the Lapland Biosphere reserve, Polar-Alpine Bot. Garden, Yamal Peninsula, Finland monitoring set, Hokkaido island, Japan, Point Barrow, Northern Alaska. As the monitoring objects both the microtine voles: *Clethrionomys ruficanus*, *Microtus agrestis*, *Lemmus lemmus*, etc., and the northern tundra biocenosis herbaceous plant determinant species *Chamaenerion angustifolium*, *Vaccinium myrtillus* etc. were used. Under consideration there were the multiannual population size cycles, their delayed density dependence, cyclic fluctuations in bio production, intensity of generative processes at the level of plant communities, herein we accent on space correlation of these events and explicit terrestrial gradients in their manifestation. It is known the NS geographical gradient in Finland in multiannual temporal pattern of population cycles of *Cl. ruficanus* etc. The spatio-temporal dynamics in vole species in Hokkaido, the northernmost island of Japan was a matter of profound attention for a number of years. In Hokkaido the north-eastern part of the island exhibit clear multiannual cycles and delayed density dependence whereas in the south only seasonal dynamics and direct density dependence were observed. The gradient in Hokkaido seems to correspond to transition zone around 60-70°N in Fennoscandia. The spatial scale in Hokkaido with respect to population dynamics is of the order of 50 km – a scale which is too large to be accounted for by movements of individual voles and consequently may be reasonably assumed to some external factors. The comparison of temporal pattern of *Cl. ruficanus* cycles revealed the high confident level coherence between NE Hokkaido with Lapland. The high level of synchrony between Bot. Garden and Lapland reserve in temporal patterns of *Ch. angustifolium* inflorescence curve in 1960 to 2000 years gap was found as well. The results obtained suggest the presence of synchronizing and plant inflorescence and vole population cycles modulating factors, the effects of which are most explicit in high fluctuations years. Such events impossible to explain in the framework of meteorological effects only, and their space effective radii sweep tens or hundreds kilometers that suggests the global scales of their causes. The mechanisms which control the temporal behavior of living systems, seemingly, possess by increased susceptibility to a weak environmental effects which can modulate, for example, the cycle parameters, and appear as a rhythm-to-alter active or synchronized agents. In consideration of these phenomena it is hardly possible to explain them in framework of traditional set of bio active environmental factors. It is needed to further elaborate as a very category of configuration space for their presentation, as also take into consideration the supplement potentially active kinds of effects sweeping all physical space for their formation and propagation. The understanding of reasons for the planet-scale environmental processes require in enlargement the arena of their consideration to troposphere and yet more, up to heliosphere. The use of such chronobiological approaches especially actual for terrestrial sites within the auroral zone where the living organisms are undergone to complex stress impacts as against the increased uninterrupted flux of effects of geospheric origin.