

**VARIABILITY AND GROWTH CHARACTERS
OF SOME SHRUB-FRUTICOSE *CLADONIA* LICHENS (CLADONIACEAE)
IN TUNDRA COMMUNITIES**

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SUMMARY

We estimated growth processes (internode elongation, internode die-off and absolute growth rate) for three model species of *Cladonia* genus (*Cladonia arbuscular* (Wallr.) Flot, *Cladonia rangiferina* (L.) F. H. Wigg, *Cladonia stygia* (Fr.) Ruoss) during three growth seasons of 2011–2013. Rates of internode elongation, internode die-off and absolute growth were obtained in measuring field experiment without removal the thalli from native communities. Sample areas were in West-Siberian forest-tundra zone and Polar Ural mountains. Sample plots were organized in different tundra communities: shrub (*Betula nana* L.) lichen tundra, dwarf-shrub-moss-lichen tundra, wet shrub lichen-moss tundra, and lichen tundra. The climate characters in the years of study were the following: 2011 «warm», 2012 «hot», and 2013 «dry».

The trends of growth variability caused by the increase of aridity due to higher temperature or precipitation decreasing. Internode elongation of lichen thallus was 10 % in «not year» and 2 % in «dry year» down from the «warm year». The greatest decrease was revealed in mountain dwarf-shrubs-moss-lichen tundra during «hot» season. Lichen internode elongation in forest-tundra communities did not change significantly but maximal elongation was found in shrub lichen tundra. Internode die-off was 23 % down in «hot year» and 6 % up in «dry» year. Internode die-off decreased in «dry» and «hot» seasons in the midst of water deficit. The greatest decrease was found in exposed mountain tundra (about 30 %) in «hot year». The rate internodes die-off decrease in «hot year» (especially in shrub lichen tundra) and raced up in «dry year» in wet shrub lichen-moss tundra. The greatest absolute growth rate was found in «hot year» in dwarf-shrub-moss-lichen communities. But absolute growth decreased significantly in «dry year» to the values of «warm year». Whereas lichen absolute growth rate was constant enough in mountain tundra communities and went up 5 and 13 percent in «hot» and «dry» years respectively. Thus internode elongation and die-off varied extensively but absolute growth was constant enough.

In sample area model *Cladonia* lichens are at stage renewal of growth the rate of internode elongation and die-off is balanced.

Key words: *Cladonia*, growth rate, internode elongation, internode die-off, forest-tundra, West Siberia, Polar Urals.