

The aim of the proposed diploma thesis was to analyze temperature and pH related shape variation in synurophyte silica scales. Four species were investigated – *Synura petersenii*, *S. echinulata*, *S. sphagnicola* and *Mallomonas tonsurata*. The strains were cultivated in 5 different temperature levels. Moreover, *S. petersenii* and *M. tonsurata* were grown in 4 (resp. 5) different pH levels, too.

The shape dynamics of the scales was investigated with application of landmark based geometric morphometric methods. The relative warps analysis described the overall shape and the main trends in morphological variation were depicted as deformation grids.

The effects of both cultivation temperature and pH on the scale shape were significant, although only a small proportion of the overall variation was explained by the particular regression models.

Moreover, the scale size of the investigated species decreased with increasing temperature (with the exception of *Synura echinulata*). These results are in agreement with the Atkinson's temperature rule which was formulated for the body size of ectotherms. The relationship between the size and pH was not explicit - the size of the scales decreased with increasing pH in *S. petersenii*, but increased in *M. tonsurata*.

Furthermore, the scale shape was also found to be related to the scale size. However, there was still a significant impact of temperature (or pH) on scale shape after separation of an allometric component of scale shape variation.

Finally, morphological disparity (=the extent of morf. variation) in different treatments was studied. The scales from the highest (or sometimes even the lowest) levels of experimental temperature were the most variable in their shapes. Similarly, high levels of disparity occurred also in suboptimal pH levels. These results suggest that prolonged exposition to extreme conditions may be interpreted as a consequence of environmental stress.