Aim of the study: To analyze and to regulate the process of essential oils formation, it is advisable to use biotechnological methods of in vitro culture. The study of the morphogenetic potential of various thyme species and its varieties will make it possible to select the optimal object for subsequent studies in the field of secondary synthesis regulation and its intensity increasing. Independence from external conditions and high efficiency of secondary metabolites production in vitro make this technology attractive for drug manufacturers. The aim of this work is to study the callusogenesis potential of various species and varieties of thyme.

Material and Methods: Internode and leaf segments of thyme were placed on the Murashige and Skoog nutrient medium (MS) with a different ratio of growth regulators of cytokinin’s (BAP, kinetin) and auxin’s (2,4-D, IAA) nature for the callusogenesis induction. The frequency of callus formation was considered. The resulting calli were transplanted to fresh nutrient medium regularly after 28-30 days. Explants were cultured at a 16-hour light day.

Results: As a result of the conducted studies it was established that during the cultivation of leaf and stem explants on most analyzed nutrient media, callusogenesis induction occurred already on the 10-14th day. Callus, derived from different types of thyme explants, had morphological differences. From the stem segments, a dense beige callus, sometimes with white areas, was formed. The callus tissue obtained from the leaf explants was also dense and green or light green with a beige areas. The morphological characteristics of the callus did not depend on the used nutrient medium modifications, except for the medium containing 2,4-D. In this case, from the stem and leaf explants, the formation of a watery, loose callus occurred, which easily decays into fragments. When cultivating the primary callus on the medium with a lower auxin concentration, a secondary callus was quickly formed. The transfer callus culture did not have morphological differences depending on the origin, or explant type. The callus tissue had a fairly dense structure, as a result of prolonged cultivation of callus on the medium, accumulation of phenols in callus tissues and medium was observed, after two weeks the callus and nutrient medium acquired a brown, sometimes dark brown color.

Keywords: Thymus L., Lamiaceae, thyme species, in vitro culture, morphogenesis, secondary metabolites