

Genetic variability of tea plant (*Camellia sinensis* (L.) Kuntze) on the Black Sea coast of Caucasus

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Motivation and Aim: It is known that the frequency of spontaneous hereditary variability depends on plants species. There is a high genetic variability and plasticity observed in tea plant (*Camellia sinensis* (L.) Kuntze) grown in natural conditions [1]. Moreover, the increase of genetic variability of tea is influenced by various environmental factors, such as temperature shocks, high radiation, high doses of fertilizers etc. The spectrum of somatic mutations of tea is represented by morphological, physiological or plastid modifications. Deviations in length, width, shape, surface (smooth, bubbly), and degree of leaf serration, leaf positions, and the length of the internodes are occurred most often among the morphological traits. Physiological changes are manifested as the leaf color change from yellow-green to dark-green, as well as various degree of anthocyanin color, lengthening the vegetative period, reducing generative activity, increasing yield. In turn, the plastid mutations are represented by sectorial and periclinal chimeras [2]. The aim of current work is to reveal genetic variability in two tea genotypes on the Black Sea coast of Caucasus.

Methods: Studies were carried out on tea cultivar Kolkhida, and population Kimyn (large-Chinese varieties) grown in the region of the Black Sea coast seeds were germinated in a thermostat at a temperature of 27–30 °C. Cytological and karyological analysis were performed on root meristems using the Carnoy fixation, and staining with acetocarmine.

Results and conclusion: The highest frequency of chromosomal rearrangements was noted in the Kymyn population of 2.2–5.9 %. Positive correlation between the frequency of somatic mutations and the frequency of cells with aberrations was noted. The Kolkhida variety was characterized by a lower frequency of altered anaphases. Moreover, a higher frequency of chromosome rearrangements was noted in regions with increased use of chemical fertilizers: the differences were statistically significant in the varieties of the Kymyn population ($P < 0.001$) and in the Kolkhida variety ($P < 0.05$). Thus, the frequency and spectrum of chromosomal aberrations of tea depend on the genotype and area of growth. Among the studied forms, the variety Kimyń is more variable. High genetic variability of can serve as a material for obtaining new tea cultivars.

References

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