

## 氟对茶树生长、叶片生理生化指标与茶叶品质的影响

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## Effects of fluorine stress on growth, physiological-biochemical characteristics and quality of tea leaves

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**摘要** 以2个茶树品种为试验材料, 通过土壤盆栽试验, 研究了土壤添加氟浓度为0~200 mg/kg对茶树生长、叶片生理生化指标与茶叶品质的影响以及茶树的氟累积特性。结果表明, 随氟处理浓度增加, 茶树的生长、叶绿素合成和光合作用均受到明显抑制; 福鼎大白茶的SOD、CAT和POD活性均随氟处理浓度的增加呈先升高后降低趋势, 名山白毫的3种酶活性则受到明显抑制。2个品种的新梢中游离氨基酸、儿茶素组分和咖啡碱含量也随施氟浓度的增加总体呈下降趋势, 茶叶品质降低, 表明氟可能抑制茶树儿茶素的合成代谢和氮素代谢。茶树的氟累积量也随着土壤氟水平的增加而增加, 且各器官的氟含量(y)与土壤中添加的氟(x)呈显著或极显著线性正相关; 茶树的聚氟能力依次为叶片>新梢>枝条>茎>根, 叶片是氟累积的主要器官。福鼎大白茶耐氟、抗氟的能力明显强于名山白毫, 但氟累积能力则低于名山白毫。

**关键词:** 茶树 氟 生理生化指标 生长 品质

**Abstract:** With a pot experiment, effects of fluorine stress with different concentrations (0—200 mg/kg) on growth, physiological-biochemical indexes of leaves, abilities of accumulating fluorine and quality characteristics in two tea cultivars (Mingshanbaihao and Fudingdabaicha) were studied. The results show that chlorophyll synthesis, tea plant growth and photosynthesis are significantly inhibited with the increase of fluorine stress. Meanwhile, the activities of SOD, CAT and POD in Fudingdabaicha are tended to increase at first and then decrease with the increase of fluorine stress. However, the activities of SOD, CAT and POD in Mingshanbaihao are significantly inhibited. The components of catechin and contents of free amino acids and caffeine, which are the indexes of the quality of tea, are decreased. These results indicate that the fluorine stress might restrain catechin synthesis and nitrogen metabolism. The accumulation of fluorine in tea plant is increased with the increase of fluorine concentration in soil. The total content of fluorine (y) in all organs of tea plant is significantly positively correlated with the fluorine concentrations (x), and the distribution order of fluorine in tea plants was: leaves > new shoots > branches > stems > roots. It's highlighted that Fudingdabaicha has a much better ability of tolerance and resistance to fluorine than that of Mingshanbaihao, while Mingshanbaihao accumulates more fluorine.

**Keywords:** tea plant fluorine physiological and biochemical indexes growth quality

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