

A STUDY OF THE FACTORS CONTROLLING VARIATION OF CUTICULAR CHARACTERS

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In this study we examined three factors which we thought might cause variation in the cuticular characteristics of leaves. These factors were leaf shape, leaf maturity, and the amount of sunlight that reached the leaf. The purpose of this study was to help resolve some of the controversy surrounding the use of cuticular analysis as a means of plant identification. The species investigated for differing morphology was Quercus alba, White Oak, Fagus grandifolia, American Beech, and Quercus rubra, Red Oak, were used for the study of sunlight versus shade leaves. Young leaves of these trees were later examined in order to understand the development of the epidermis. The cuticular characteristics looked for were the following: shape and size of the epidermal cells and stomata, presence and density of hairs, density of stomata, and pattern of the accessory cells. We found that neither the shape of the leaf nor the position on the leaf from which a cuticular sample was taken hindered the identification of the leaf cuticle. There were slight variations observed, however the variations were not severe enough to raise any doubts as to the species from which the cuticle had been obtained. Both of the species studied as sun versus shade leaves showed definite cuticular variations. There were many more stomata and the cells of the lower epidermis were much less lobed on the leaves that grew in the sunlight. The cells of the upper epidermis of the beech were more lobed on the shade leaves while the upper epidermis of the oak was the same in both sun and shade leaves. The other cuticular characters were similar on both sun and shade leaves. Upon studying the development of the epidermis in young leaves it was found that the mature situation of guard cells and stomata can be seen early in the development of a leaf while the development of the epidermal cells may follow different paths as the leaves mature.

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