

THE CHEMICAL ECOLOGY OF THE LESSER CHESTNUT WEEVIL: BEHAVIORAL AND ELECTROPHYSIOLOGICAL RESPONSES OF *CURCULIO SAYI* (COLEOPTERA: CURCULIONIDAE) TO HOST-PLANT VOLATILE ORGANIC COMPOUNDS

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Naturally occurring plant volatiles were sampled and identified from the plant tissues of the Chinese chestnut tree. Both the plant tissues and the individual volatile organic compounds identified from these tissues were utilized in behavioral and electrophysiological studies with the primary pest insect, the lesser chestnut weevil. This insect is highly host specific, thus by identifying the attractive components released by chestnut, a more efficient monitoring and control program can be established for this economic pest. Insects were given a choice between each plant tissue and a blank control in an olfactometer, and these procedures were repeated for individual volatile compounds. Additionally, the electrical responses of the antennae of the lesser chestnut weevil (which are the primary chemoreceptors for insects) were recorded for both plant tissue and individual compounds using an electroantennogram.

Several plant tissues, including the reproductive tissues of the tree (nut, but, catkin) were found to be significantly important for host location by this insect. Moreover, out of the hundreds released by the tree, fifteen volatile organic compounds were shown to be important for this insect locating its host tree. By identifying the ecologically important chemistry behind this plant-insect interaction in chestnut orchards, this research will further aid in monitoring projects as well as ecologically sustainable control techniques for this pest insect for commercial chestnut growers across the Midwest with a decreased dependence on pesticides.