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Different Cuticular Chemical Profiles Between the Monogynous and Polygynous Foerms of the Red Imported Fire Ant, Solenopsis invicta(Hymenoptera: Formicidae), in Taiwan

Lin, Y. K. ; Chang, H. Y. ; Wu, W. J. ; Ho, H. Y. ; Lin, Chun-Chi

Abstract

The red imported fire ant, Solenopsis invicta Buren, was first discovered in Taiwan in 2003 and is now considered as a pest species, impacting native ecosystems and agriculture. Although the venom alkaloids and cuticular hydrocarbons of fire ants have been described and used to distinguish fire ant species, little is known about the discrepancy of cuticular chemicals between the monogynous and polygynous forms of this pest ant species. Since a significant difference in the proportions of unsaturated alkaloids between the monogynous and polygynous forms of S. invicta venom has been demonstrated, we here compared the cuticular chemicals from queens and workers of both social forms of S. invicta by using gas chromatography-mass spectrometry. Jointed results indicate that some cuticular chemicals including hydrocarbons and alkaloids are significantly different in absolute and relative quantities between the two forms, and it may shed light upon the remarkable differences in social behaviors with respect to recognition systems between the monogynous and polygynous ants.

Key words：Solenopsis invicta; Monogyne; Polygyne; Hydrocarbones; Alkaloids