

The role of symbionts in biological control (生物的防除における共生微生物の役割)

日時: 平成30年3月21日(水) 17:00~18:00

場所: 宮崎大学創立330記念交流会館 コンベンションルーム(会議室)

※参加費無料・事前申込不要 どなたでもご参加いただけます。

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Hunter教授は農業害虫のコナジラミ類とその天敵の寄生蜂の研究に関して、世界を代表する研究者の一人です。近年は特に虫体内にいる共生微生物のカルディニウムとリケッチアがこれらの虫に及ぼす影響を研究されており、カルディニウムによる寄生蜂の単為生殖化(PNAS, 2001)、リケッチアによるタバココナジラミの分布拡大(Science, 2011)、植物を介したタバココナジラミ間のリケッチアの水平伝搬(Proc. R. Soc. B, 2012)、リケッチアによる昆虫寄生性糸状菌感染の抑制(Appl. Environ. Microb., 2014)など、生物的防除を行う上で重要な成果を国際的に注目される雑誌に発表されています。今回は特にScience誌に発表された研究について、最新の成果を含めてご講演いただきます。みなさま奮ってご参加ください。

Maternally-inherited symbionts generally spread in host populations by increasing host fitness, or by biasing host sex towards females. The invasive globally-distributed sweetpotato whitefly species complex, collectively known as *Bemisia tabaci*, has a diverse assemblage of maternally inherited, facultative bacterial symbionts, among which *Rickettsia* is common worldwide. We found that in the Southwestern USA in the species known as "B" or "MEAM1," *Rickettsia* swept from 1% to 97% frequency in a period of just six years, from 2000-2006. In laboratory assays of whiteflies with and without *Rickettsia* in a homogenous genetic background, *Rickettsia*-infected (R+) whiteflies showed greater performance and greater female-biased sex ratios than uninfected whiteflies. In a second genetic line, *Rickettsia* appeared to confer fewer relative benefits to infected whiteflies, and introgression of the two genetic lines indicated that host nuclear genotype influenced the *Rickettsia*-whitefly phenotype. Interestingly, while *Rickettsia* frequencies stayed high in the field for at least 5 years, from 2006-2011, in 2015, the frequency of *Rickettsia* had dropped to about 60% where it has remained for the last two years. Isolines established from the field in 2016 showed similarly high rates of vertical transmission as in earlier studies, but lower *Rickettsia* titer on average, and no longer any relationship between *Rickettsia* infection and either performance or sex ratio. These results show symbiont frequencies in host populations can change dramatically within a few years, and reflect changes in the phenotype of the symbiont-infected host. Host population structure appears to play an important role in these dynamics.

キーワード: コナジラミ、寄生蜂、共生微生物、リケッチア

【問い合わせ窓口】

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