

Abstract

Field surveys were carried out in four agroecological zones to assess the geographic distribution, host range and perennation of *Cotesia sesamiae* and *Cotesia flavipes* in cultivated and natural habitats in Kenya. The distribution of the two *Cotesia* species in different ecological regions was most affected by the suitability of the local stem borer species for parasitoid development, and temperature, as both species were found in localities dominated by their suitable host(s) where temperature favoured their occurrence. Fourteen years after its release, *C. flavipes* has maintained a high level of specificity to its target host *Chilo partellus* on maize and sorghum in cultivated habitats and on *Sorghum arundinaceum* in natural habitats. *Cotesia flavipes* appeared to be an appropriate biological control agent against *C. partellus* in eastern Africa, with minimal or no effects on non-target hosts in different habitats. Conversely, *C. sesamiae* lacked host specificity in different habitats, as its stem borers or host plants varied with both locality and habitat type. Perennation by both *Cotesia* species occurred mainly in cultivated habitats. Furthermore, natural habitats played a role in sustaining some individuals of *C. flavipes* during both rainy and dry seasons. These areas acted as refuges for *C. flavipes*, but not for *C. sesamiae*, because its hosts were scarce on natural host plants. The availability of these *Cotesia* species across seasons was mainly influenced by the presence of actively feeding stem borers on cereal plants during different seasons, as well as the duration of the dry season in different localities.