# NOTE

## Introduced *Chrysomya* (Diptera: Calliphoridae) Flies in Northcentral Alabama[1]

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*Chrysomya rufifacies* (Macquart) and *C. megacephala* (F.) are Old World flies that have spread to the continental USA following their separate introductions into Latin America (Guimarães, do Prado, and Buralli, 1979, Rev. Bras. Entomol. 23: 245-255; Jirón, 1979, Brenesia 16: 221-222). Initially, both species expanded their new ranges at a tremendous rate, which is perhaps no surprise given that calliphorids have often been observed to travel several kilometers in 1 d (Norris, 1965, Annu. Rev. Entomol. 10: 47-68). *Chrysomya rufifacies* was first reported from the Americas in Costa Rica in 1978 (Jirón 1979). It was found to be widely distributed in Texas by 1982 (Richard and Ahrens, 1983, Southwest. Entomol. 8: 216-218) and was collected in California and Arizona before the end of the decade (Baumgartner, 1986, J. Entomol. Sci. 21: 130-132; Greenberg, 1988, J. Med. Entomol. 25: 199-200). By 1991, a separate population of *C. rufifacies* was established in Florida (Baumgartner, 1993, J. Med. Entomol. 30: 338-352). *Chrysomya megacephala* was apparently introduced to Brazil in 1975 (Guimarães, do Prado, and Buralli 1979), and established populations were discovered in Los Angles in 1988 (Poorbaugh, 1989, Vec. Ecol. Newsl. 20: 8-9) and in Florida in 1992 (Baumgartner 1993).

Both flies, *C. megacephala* in particular, are potential mechanical vectors of microbes causing enteric disease (Greenberg, 1973, Flies and Disease. Vol. 2. Biology and Disease Transmission, Princeton Univ. Press; Olsen, Sidebottom and Bennett, 1993, Bull. Soc. Vec. Ecol. 18: 133-146), and both, *C. rufifacies* in particular, can be agents of myiasis (Kitching, 1976, Bull. Entomol. Res. 66: 195-203; Baumgartner 1993). Perhaps the greatest applied importance of these flies within developed countries is as forensic evidence (Goff and Odum, 1987, Am. J. Forens. Med. Pathol. 8: 45-50; Goodbrod and Goff, 1990, J. Med. Entomol. 27: 338-343; Wells and Kurahashi, 1994, Jpn. J. Sanit. Zool. 45: 303-309; Byrd and Butler, 1997, J. Med. Entomol. 34: 353-358). Field and laboratory observations also suggest that *Chrysomya* are

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displacing native flies, particularly *Cochliomyia macellaria* (F.) (Baumgartner and Greenberg, 1984, J. Med. Entomol. 21: 105-113; Wells and Greenberg, 1992, Bull. Entomol. Res. 82: 133-137; Wells and Kurahashi, 1997, Pan-Pac. Entomol. 73: 16-20).

Had these flies spread within this country at the same rate at which they reached it, then both would be now common from coast to coast. However, it appears they are spreading much more slowly. Although *C. rufifacies* has been common in large portions of Texas for more than a decade, few specimens have been reported from neighboring states. Larvae were collected from an animal carcass in southeastern Colorado in 1994 and from a second carcass in Denver in 1996 (De Jong and Chadwick, 1997, J. Kansas Entomol. Soc. 70: 47-51). A small number of adults were collected in Omaha, NE (Figarola and Skoda, 1998, J. Entomol. Sci. 33: 319-321). Despite an ongoing carrion-fly research program by C. Lamar Meek and his students in Louisiana, *C. rufifacies* was not found in that state until 1995 (Martin, Carlton and Meek, 1996, Southwest. Entomol. 21: 477-478).

Single specimens of *C. megacephala* were collected in Texas in 1989 (Wells, 1991, J. Med. Entomol. 28: 471-473), and in New Mexico in 1994 (De Jong, 1995, Entomol. News 106: 192), but it was not clear if these represented breeding populations at the collection sites.

*Chrysomya* species have not been reported from states adjacent to the dense populations in Florida. However, it may simply be that carrion-fly surveys have not been made or that the data have not been published. During 21-27 September 1998, I collected adult carrion flies at a decayed-meat bait in a residential neighborhood near the center of Birmingham, AL, approximately 270 km from the Florida panhandle. The 808 Calliphoridae in this sample included 99 *C. rufifacies* and 189 *C. megacephala.* I also examined 55 third-instar *C. rufifacies* that were collected 27 October 1998 from a human corpse discovered in Green CO, AL, approximately 130 km southeast of Birmingham and near the Mississippi border.

In order to assist local entomologists in recognizing these introduced flies, representative adult specimens of *C. rufifacies* and *C. megacephala* have been deposited in the insect museums of Auburn University, Clemson University, Mississippi State University, and the University of Georgia. A key to the adults is provided by Dear (1985, Rev. Bras. Zool. 3: 109-169), and descriptions of the larvae are provided by Tantawi and Greenberg (1993, J. Med. Entomol. 30: 646-648) for *C. rufifacies* and Kitching (1976, Bull. Entomol. Res. 66: 195-203) for *C. megacephala. Chrysomya rufifacies* is one of several *Chrysomya* species whose larvae are "hairy", e.g., with large tubercles, and dark-colored when mature. As a result they are quite distinct from the native North American fauna. A more comprehensive larval key separating the introduced *Chrysomya* from North American species is will soon be available (Wells, Tantawi and Byrd, in press, J. Med. Entomol.).