

**A new and earlier record of *Chrysomya megacephala* in South Africa, with notes on another exotic species, *Calliphora vicina* (Diptera: Calliphoridae)**

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ABSTRACT

South African records of *Chrysomya megacephala* and *Calliphora vicina* are reviewed and plotted on maps. Dispersal routes of these two forensically and medically important blowfly species are discussed. Emphasised is the importance of deposition of voucher material in museum collections.

KEY WORDS: Calliphoridae, *Chrysomya megacephala*, *Calliphora vicina*, blowflies, invasive, alien, distribution, dispersal.

INTRODUCTION

The increased trade between South Africa and other countries over the past few decades has increased the possibility of invasive species being accidentally introduced into South Africa. Although quarantine regulations are in place, they do not eliminate alien invasions, since insects like flies are difficult to contain. There are specimens in several South African museums that reflect accidental introduction and prove museum collections to be a valuable source of information of this kind (Suarez & Tsutsui 2004).

OBSERVATIONS AND COMMENTS

*Chrysomya megacephala*

*C. megacephala* Fabricius is a forensically and medically important fly (Tantawi *et al.* 1996; De Souza & Linhares 1997; Centeno *et al.* 2002). It has been recorded breeding in human faeces, meat and fish (Laurence 1981, 1986) and as such, is a vector for diseases. Knowledge of its distribution in South Africa is therefore of great importance if we are to make use of its forensic potential and combat the spread of disease.

A specimen of *C. megacephala* housed in the Natal Museum was collected by M.E. Irwin in September 1971 in Amanzimtoti, and identified by F.K.E. Zumpt in 1979. This specimen predates the first published record of *C. megacephala* in South Africa, from specimens recorded in March 1978 at Yzerfontein on the south-west coast (Prins 1979, 1982; Braack 1991). Prins (1982) stated that the contemporary distribution of *C. megacephala* was restricted to the Cape Town–Yzerfontein and Durban areas. The reference to Durban presumably alluded to a specimen in the South African Museum that was collected by Prins in 1982 in Durban. L.E.O. Braack subsequently recorded *C. megacephala* in the Kruger National Park in 1984, and provided evidence that it was a recent arrival in the area (Braack 1991). A specimen was collected at Hogsback in

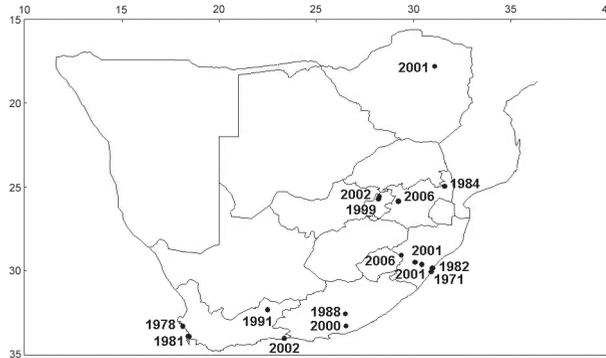


Fig. 1. Distribution of *Chrysomya megacephala* in southern Africa, with date of first record for each site.

March 1988 by P.G. Hensberg, and this nuisance fly has since been collected in many parts of the country (Fig. 1). It was, however, not recorded during extensive surveys of Northern Cape, Northwest and Free State provinces in 2003 and 2005 (Villet, Richards and Midgley, unpubl. data).

*C. megacephala* was recorded in Mauritius in 1962, and its original distribution was apparently south-east Asian and east African (Pont 1980); this species was introduced to South America via Brazil in the 1970s (Laurence 1981, 1986). Braack (1991) speculated that the species might have spread to the Kruger National Park from Cape Town, or by entering South Africa from the north or from the east, via the port of Maputo. The Amanzimtoti record raises further possibilities. However, we suggest that such speculation is currently pointless because specimens of two related flies, *C. albiceps* Wiedemann and *C. marginalis* Robineau-Desvoidy, can disperse about 2.25 km/day and have been recovered 37.5 km and 63.5 km respectively, from where they were released (Braack & Retief 1986; Braack & de Vos 1990). At such rates, even if *C. megacephala* blowflies were active for only half of the year, the species could spread over 3000 km a decade, as it did in South America (Laurence 1981, 1986). If it arrived in South Africa only in 1971, it would still have had seven years to migrate to Cape Town and 13 years to reach the Kruger National Park. Furthermore, this species has been trapped aboard the research vessel, FRS Algoa, while she was over 200 km offshore (Villet, unpubl. data), and can clearly be transported by such means (cf. Laurence 1981, 1986). Representatives of this species may therefore have disembarked from ships from Mauritius or east Africa at several South African ports.

More recently, records from different parts of the country have shown that *C. megacephala* has spread to various locations throughout South Africa (Fig. 1). In the 35 years since the first record of this species in South Africa, it has extended its range into Western Cape, KwaZulu-Natal, Eastern Cape and Gauteng provinces (Fig. 1). Although very different in biology, specimens of *C. megacephala* were misidentified as *C. bezziana* (e.g. Braack 1991). This may account for its apparent absence from Northern Cape, Free State, North West and Limpopo provinces. Lack of records from these provinces may also be due to inadequate sampling during periods when this fly is active.

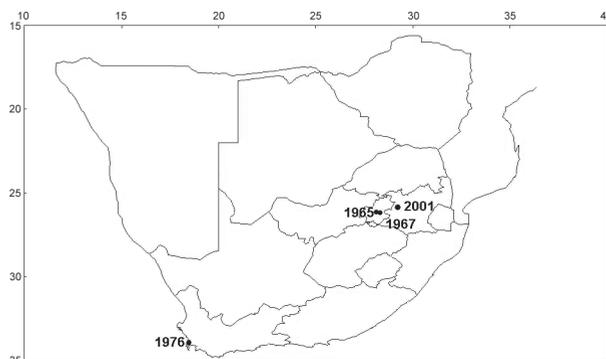


Fig. 2. Distribution of *Calliphora vicina* in southern Africa, with date of first record for each site.

### *Calliphora vicina*

Another invasive blowfly species in South Africa is the European species *Calliphora vicina* Meigen. *C. vicina* was first recorded in South Africa in 1965, when a specimen was collected in Johannesburg, and again in 1967 and 1969, in Benoni near Johannesburg International Airport. In 1976 two specimens were caught in Cape Town by Prins, but were not recognised as *C. vicina* until 2004. There are no other records of this species until 2001 when a specimen was caught in Witbank, about 100 km east of Johannesburg International Airport (Fig. 2). Two issues arise from these records. First, it is apparent that in addition to harbours, airports also serve as entry points for invasive fly species. *Chrysomya* species has been found in the luggage holds of aircraft, and larvae have been found in dried meat and fish arriving at Houston Airport, Texas (Laurence 1981, 1986). Second, the gap in the record of specimens from 1976 to 2001 almost certainly reflects erratic collecting and monitoring, as well as the misidentification of *C. vicina* as the similar indigenous species *C. croceipalpis*, rather than the disappearance of the species and its subsequent reintroduction.

*C. vicina* is a forensically important blowfly in Europe and the New World (Davies 1999; Amendt *et al.* 2000; Centeno *et al.* 2002). It thus has the potential to become a forensically useful fly if it becomes established in South Africa. It is therefore important that the distribution of this fly be well monitored so that its potential use in forensic investigations is not overlooked.

### CONCLUSION

It is clear that invasive blowfly species are entering the country via harbours and airports and that their presence in the country has not been monitored successfully. Museum collections play a vital role in providing information on the location and spread of such invasive species. However, this information could become more comprehensive and useful if voucher material from biological surveys, no matter how familiar or common the species might appear to be, is systematically deposited in museum collections. The lack of awareness of the presence of certain species in the country could also be a result of an insufficient number of qualified experts capable of correct identification (also Williams & Villet 2006).

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