

# A first, local DNA barcode reference database of the forensically important flies (Diptera) of the island of La Reunion

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**Background:** Forensic entomologists use fly larvae of the order Diptera to establish the time interval between death and body discovery. The identification of these flies is decisive in forensic casework but is hampered by difficulties in identification and the potential presence of fly larvae that are of no forensic interest. The identification of forensically relevant fly species, and their discrimination from non-forensically important species is facilitated with DNA barcoding but only if a representative local reference barcode library is available.

**Results:** We constructed a local reference library of 195 COI barcodes from 29 species of the families Calliphoridae, Fannidae, Muscidae, and Sarcophagidae from the island of La Reunion. Our results show that (i) the library contains most of the forensically relevant species of these families from the island, and (ii) all fly species can be unambiguously identified with DNA barcoding using a variety of analytical methods. Two public libraries (GenBank and the Barcode of Life Data System (BOLD)) only allowed to identify half the number of species of these families present in La Reunion, showing that both libraries are not representative for this island fauna. Furthermore, 9 of 10 species with a forensic interest could be identified using both public libraries, showing that, for forensic casework, the libraries prove helpful.

**Significance:** This is the first DNA barcode reference database for the forensically important fly species of La Reunion. The database will contribute to the growing use of dipteran larval composition on corpses to estimate the post-mortem interval.