**Additional files:**

**Additional file S1. Raw MS spectra from legs and thoraxes of mosquitoes added to the MS reference database.** MS spectra were obtained using a MicroFlex LT MALDI-TOF Mass Spectrometer (Bruker Daltonics) and details are presented in the excel file.

**Additional file S2. Phylogenetic tree of COI gene from *Culex* genus.** Unrooted Maximum Likelihood treeof the 36 *Culex* specimens for which Legs and thorax MS spectra were included in the MS database and with, for each species, an associated reference sequence in purple.

**Additional file S3. Representative legs MS spectra of *Culex idottus* specimens.** Excluded MS spectra of legs from the two *Cx. idottus* specimens due to the low intensity and inter-sample heterogeneity of MS profiles. a.u., arbitrary units; Cx., *Culex*; m/z, mass-to-charge ratio.

**Additional file S4. Top five mass peak list per mosquito species using legs.**

**Additional file S5. Top five mass peak list per mosquito species using thoraxes.**

**Additional file S6. Comparison of paired body parts LSVs from MS spectra of *Culex* species.** Dashed lines represent the threshold values (LSV ≥ 1.8), for relevant identification. An enlargement of LSVs upper than 2 from MS spectra obtaining for both legs and thoraxes is presented. a.u., arbitrary units; LSV, log score value.