

Raharimalala F.N.^{1,2}, Boukraa S.¹, Bawin T.¹, Zimmer J.-Y.¹, Francis F.¹
¹Functional and Evolutionary Entomology – University of Liege (GxABT) – Belgium
²Institut Pasteur – Madagascar; Email: entomologie.gembloux@ulg.ac.be

Introduction:

Due to increasing resistance to various pesticides currently used, research of alternative solution is promoting the use of endosymbiotic bacteria (1). In this study, eleven species of Culicidae (*Culex pipiens* s.l., *Cx. torrentium*, *Cx. hortensis*, *Anopheles claviger*, *An. maculipennis* s.l., *An. plumbeus*, *Culiseta annulata*, *Ochlerotatus geniculatus*, *Oc. dorsalis*, *Aedes albopictus* and *Coquillettidia richiardii*) from eight sites of Belgium were used for the screening of the presence of six genera of important endosymbiotic bacteria (2, 3): *Wolbachia* sp, *Commamonas* sp, *Delftia* sp, *Pseudomonas* sp, *Acinetobacter* sp and *Asaia* sp. PCR of 176 individual mosquitoes (144 larvae and 32 adults) were used for the screening.

Materials and methods:



Different types of breeding sites (larvae collections)



Different methods of adults captures



DNA extracted + PCR with specific primers

All positives PCR were sequenced and confirmed with comparison of data deposited in GenBank. Sequences of positives endosymbiotic bacteria are also deposited in GenBank.

Results:

Table 1: Mosquito larvae species, number of individuals tested and endosymbiotic bacteria screened

Species	<i>Cx. pipiens</i> s.l.	<i>Cx. torrentium</i>	<i>Cx. hortensis</i>	<i>An. claviger</i>	<i>An. maculipennis</i> s.l.	<i>Cs. annulata</i>
Wol 16S	17 (35,4%)	0 (0%)	1 (16,7%)	0 (0%)	0 (0%)	0 (0%)
<i>Commamonas</i>	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<i>Delftia</i>	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<i>Pseudomonas</i>	45 (93,8%)	30 (83,3%)	2 (33,3%)	3 (50%)	13 (72,2%)	18 (75%)
<i>Acinetobacter</i>	25 (52,1%)	13 (36,1%)	3 (50%)	2 (33,3%)	9 (50%)	13 (54,2%)
<i>Asaia</i>	0 (0%)	7 (19,4%)	1 (16,7%)	1 (16,7%)	6 (33,3%)	7 (29,2%)
Total number:	48	36	6	6	18	24

Cx: *Culex*, An: *Anopheles*; Cs: *Culiseta*

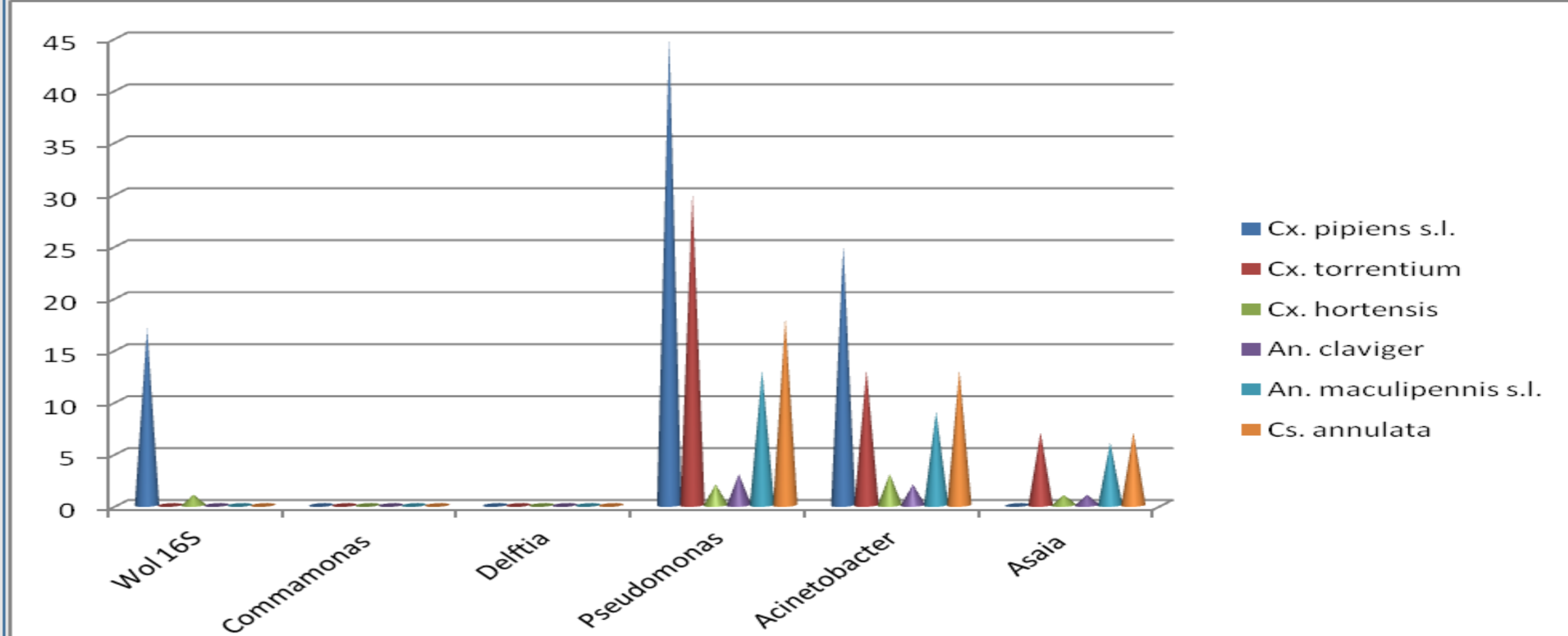


Figure 1. Distribution of endobacteria in each species (larvae)

Table 2: Mosquito adult species, number of individuals tested and endosymbiotic bacteria screened

Species	<i>Cx. pipiens</i> s.l.	<i>An. plumbeus</i>	<i>Oc. geniculatus</i>	<i>Oc. dorsalis</i>	<i>Ae. albopictus</i>	<i>Cq. richiardii</i>
Wol 16S	9 (100%)	0 (0%)	0 (0%)	1 (100%)	1 (100%)	1 (100%)
<i>Commamonas</i>	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<i>Delftia</i>	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
<i>Pseudomonas</i>	6 (66,7%)	6 (75%)	8 (88,9%)	1 (100%)	1 (100%)	1 (100%)
<i>Acinetobacter</i>	1 (11,1%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)
<i>Asaia</i>	1 (11,1%)	0 (0%)	0 (0%)	0 (0%)	1 (100%)	0 (0%)
Total	9	8	9	1	1	1

Cx: *Culex*, An: *Anopheles*; Oc: *Ochlerotatus*; Cq: *Coquillettidia*; Ae: *Aedes*

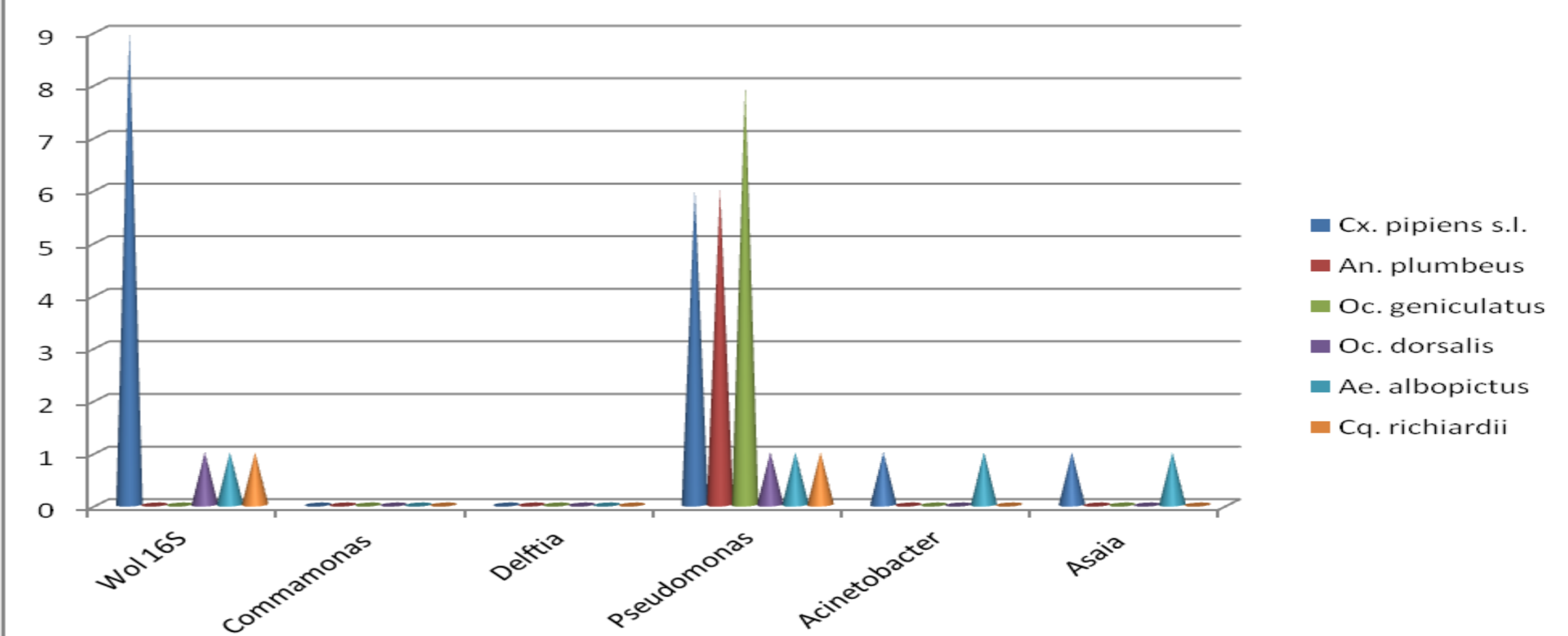


Figure 2. Distribution of endobacteria in each species (adults)

Discussion and conclusion:

- *Wolbachia*, *Pseudomonas*, *Acinetobacter* and *Asaia* were detected in all species with different proportions
- *Commamonas* and *Delftia* were totally absent in all mosquito species tested
- Considering its predominance in all species studied in this research, *Pseudomonas* would be a perfect candidate for a perspective study focusing on its role on mosquito biology and the possible impact of its removal via the use of antibiotics.

Key words: Mosquito, Endosymbiotic bacteria, Belgium, *Wolbachia*

References:

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