Presenting a new standard CO_2 trap model

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Over the last five years Centro Agricoltura Ambiente has conducted a series of field trials to evaluate the possibility of improving performances of currently used models of CO_2 traps.

Step by step we have checked the following factors in order to assess their effect on the quantity and quality of mosquito captures:

- position of the CO_2 exit holes on the dry ice container;
- plastic disk of different diameters placed under the dry ice container;
- aspiration power of the fan;
- type of fan;
- diameter of the aspiration tube;
- distance between the aspiration tube and the dry ice container.

We have developed a new model that we present to the attention of all scientists and technicians interested in hematophagous insect monitoring.
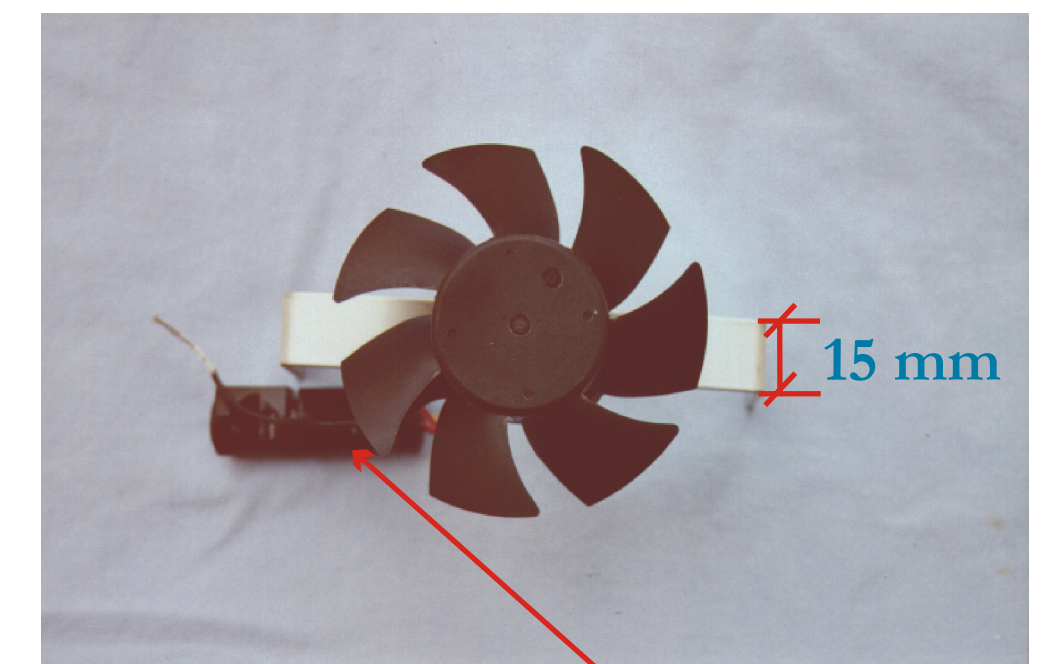
The main characteristic of the model is the easy assemble, as it is made of standard components.

Its cost results therefore low in comparison with our previous trap: complete material cost is about 60 Euro.
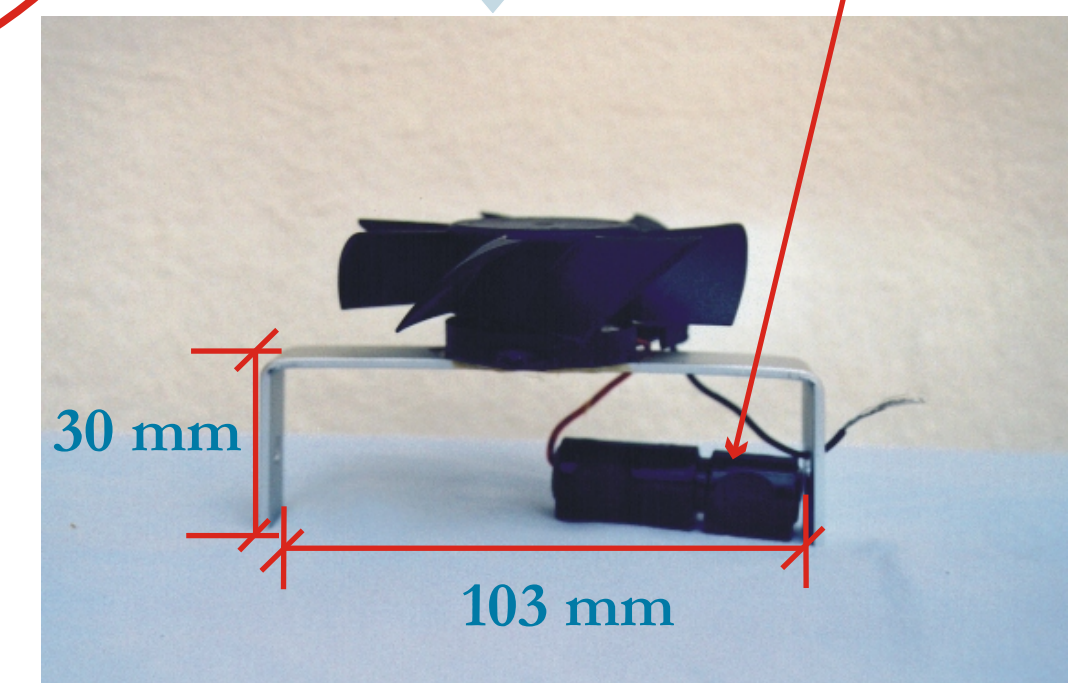
Specimens damaged < 1%.
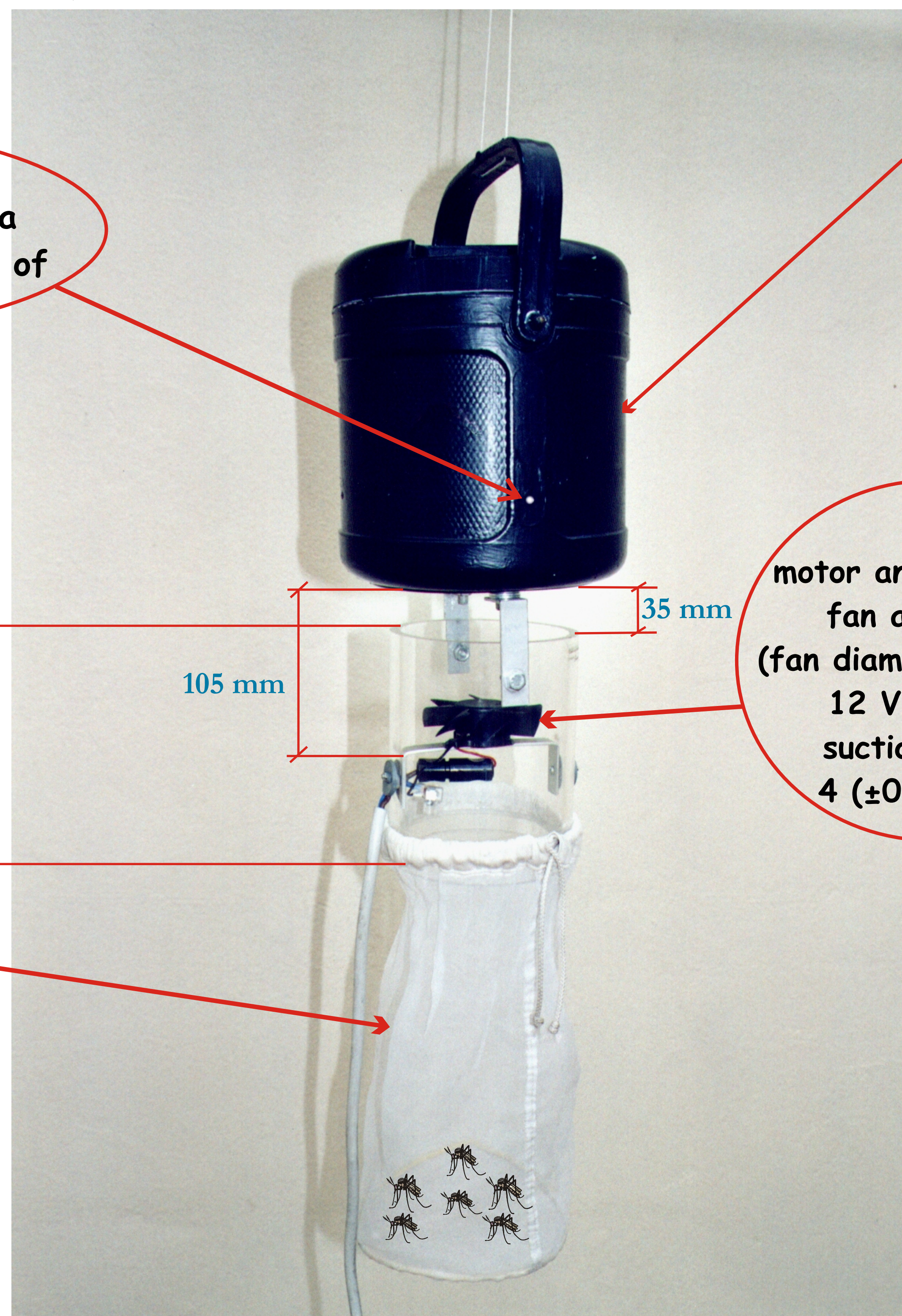
black insulated dry ice container with a 2,000 cc volume external diameter 173 mm

4 carbon dioxide emission holes (diameter 3.5 mm) positioned at a distance of 80 mm from the mouth of the suction tube

15 mm

methacrylate ester suction tube internal diameter 103 mm

35 mm

105 mm

140 mm

motor and 7-bladed fan assembly (fan diameter 80 mm) 12 V, 0.15 A suction power 4 (±0.5) l/sec

fuse (10 A; 250 V)

collection net with rigid frame and mesh < 1mm

30 mm

103 mm

rechargeable 12 V 7.5 A battery electric wire fire resistant (450/750V; 2x1.5)

Conversion index between captures obtained with new and old model trap - 2002

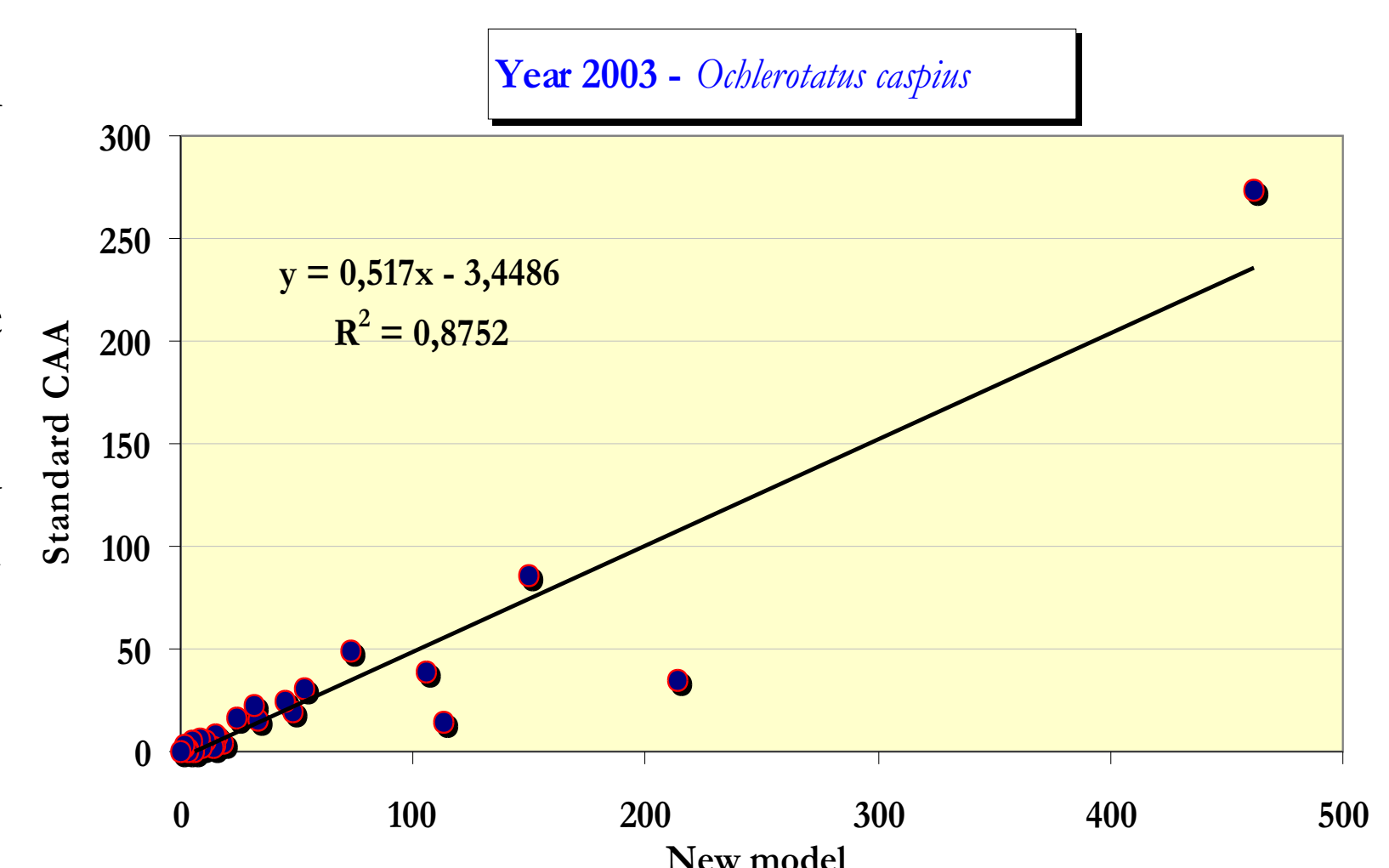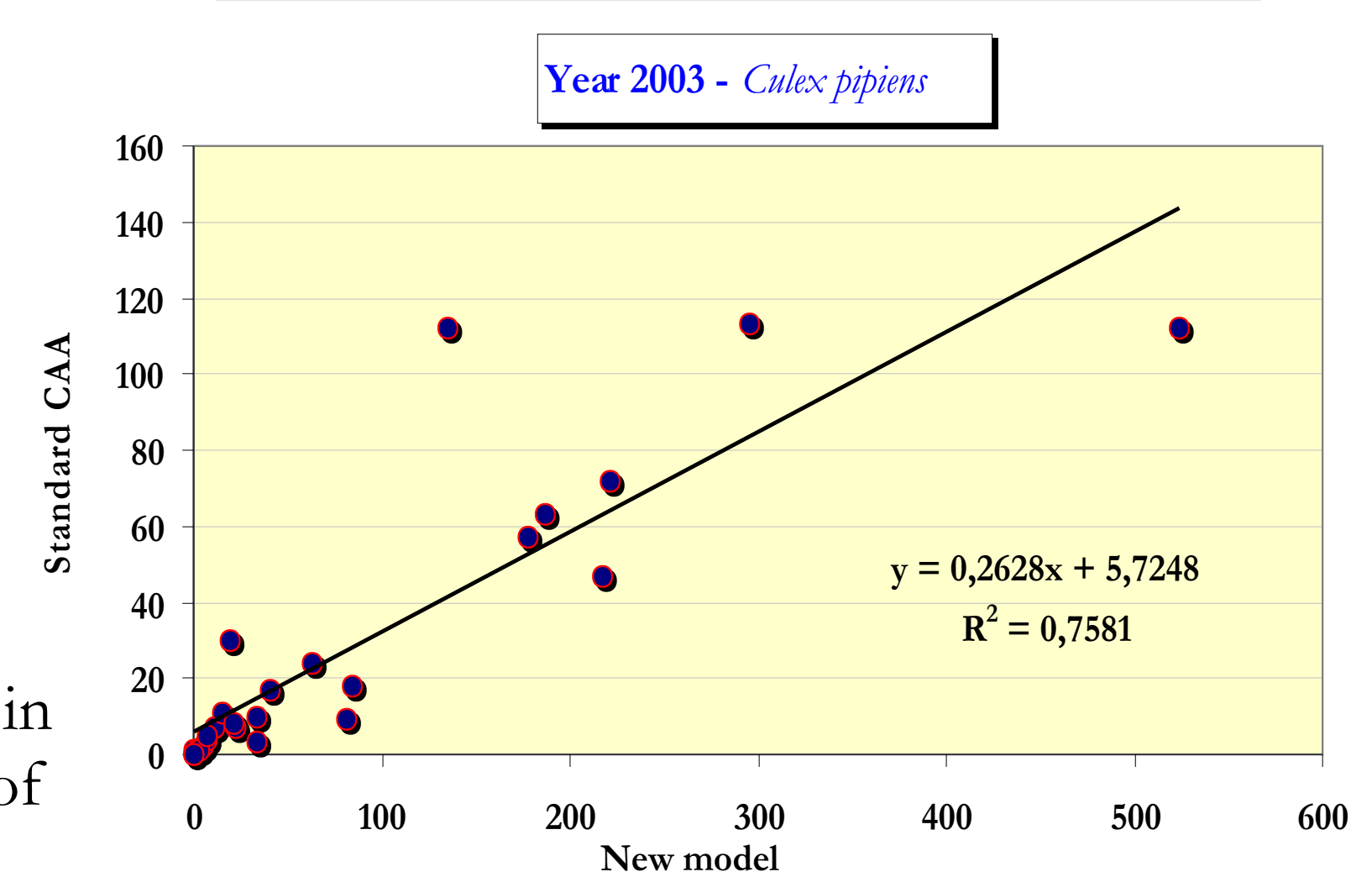|	N	Mean ± S.D. (NEW/OLD)	Min – Max
Oc. caspius	16	1.95 ± 1.52	0.58 – 6.64
Cx. pipiens	16	1.65 ± 0.60	0.71 – 2.71
Cx. modestus	10	0.99 ± 0.95	0.00 – 3.00
TOTAL	16	1.63 ± 0.57	0.86 – 2.89
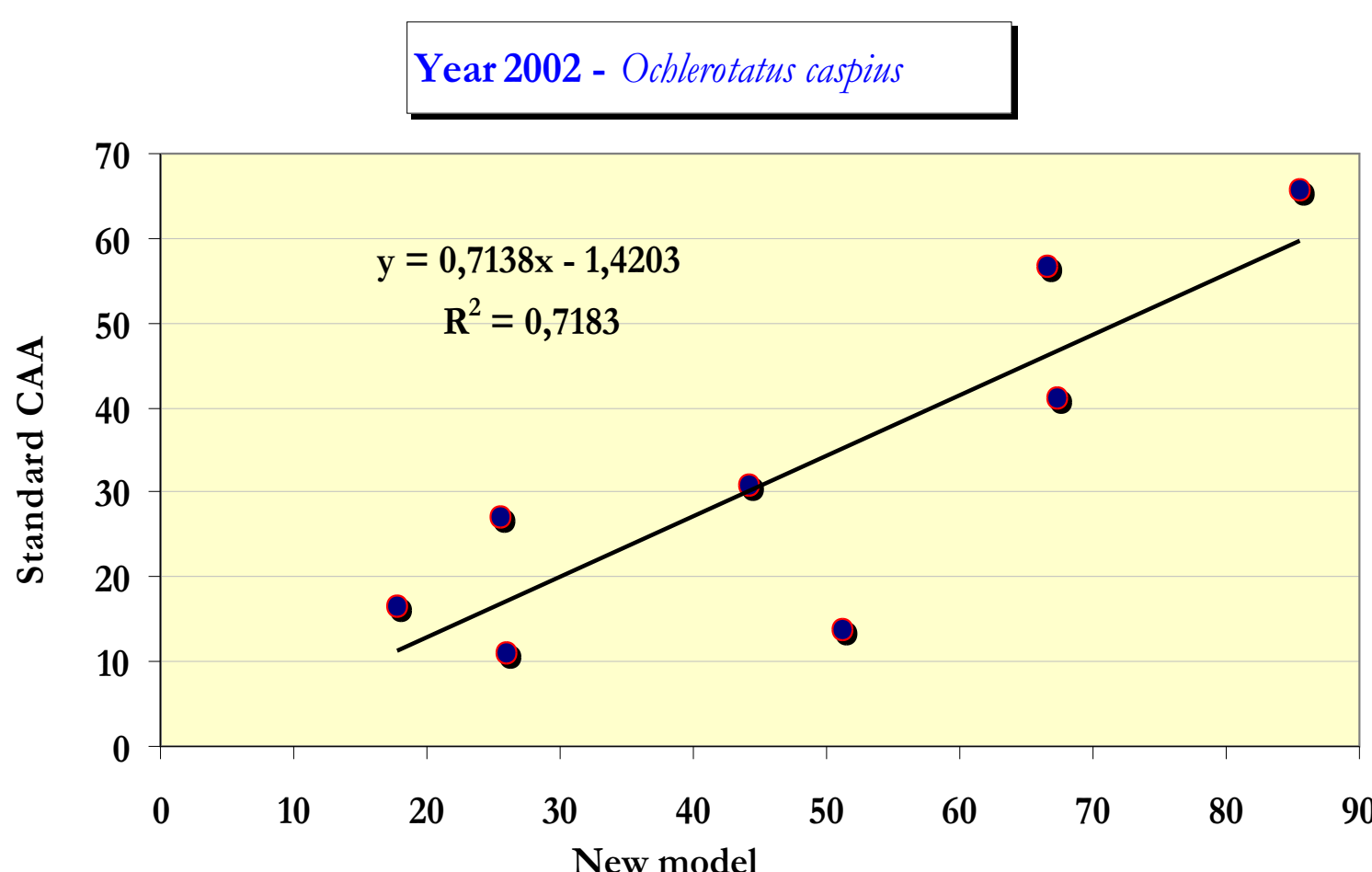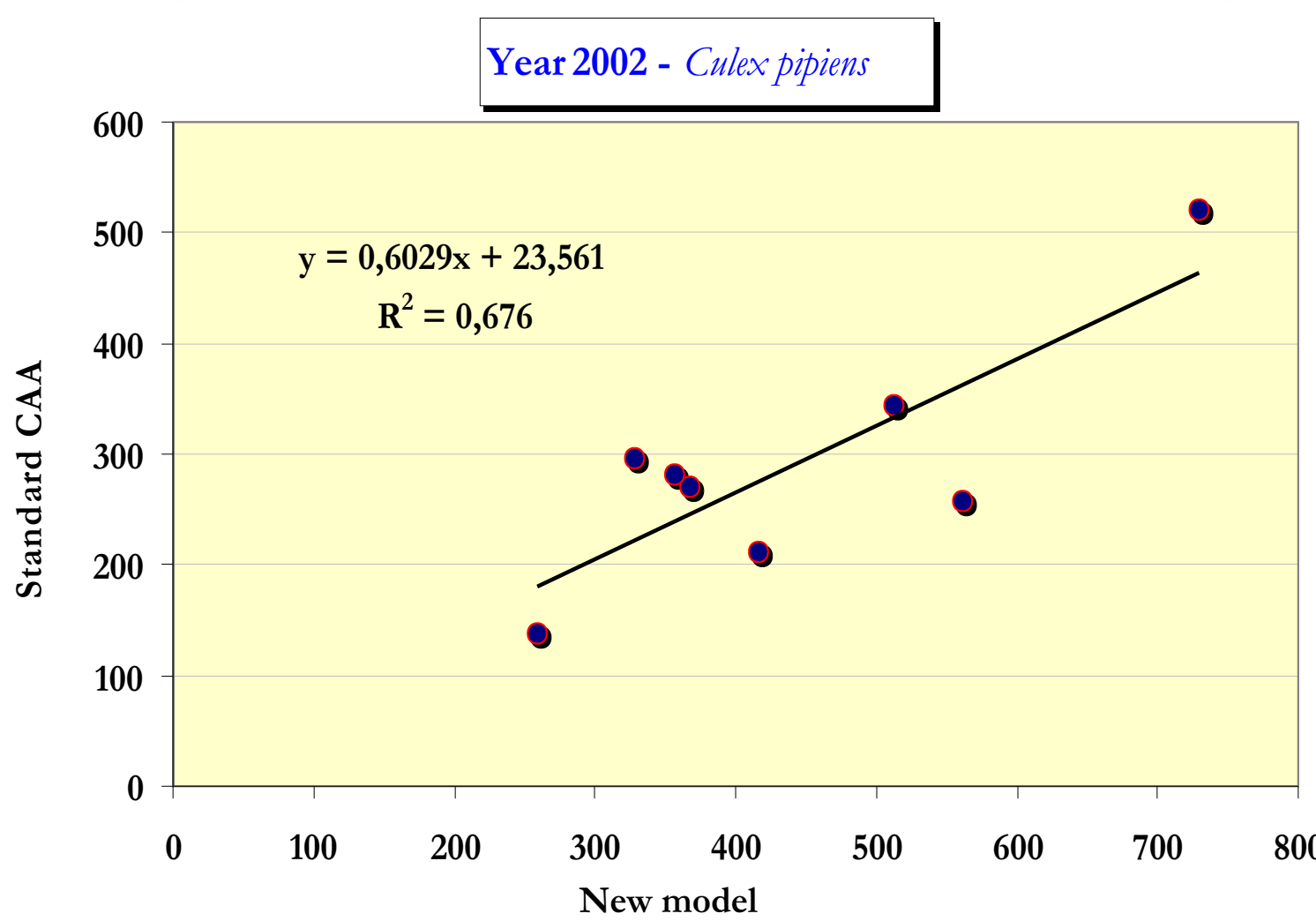
Conversion index between captures obtained with new and old model trap - 2003

	N	Mean ± S.D. (NEW/OLD)	Min – Max
Oc. caspius	16	2.81 ± 2.00	0.67 – 8.07
Cx. pipiens	16	3.15 ± 2.48	0.00 – 11.33
TOTAL	16	2.51 ± 1.32	1.00 – 6.38

Year 2002 - *Culex pipiens*
Standard CAA vs New model
$y = 0.6029x + 23.561$
$R^2 = 0.676$

Year 2002 - *Ochlerotatus caspius*
Standard CAA vs New model
$y = 0.7138x - 1.4203$
$R^2 = 0.7183$

Year 2003 - *Culex pipiens*
Standard CAA vs New model
$y = 0.2628x + 5.7248$
$R^2 = 0.7581$

Year 2003 - *Ochlerotatus caspius*
Standard CAA vs New model
$y = 0.517x - 3.4486$
$R^2 = 0.8752$

Conversion index between new standard CO_2 trap model and old CAA trap

For the purpose of comparing the two models, two identical pairs were set in place for 16 nights in 2002 in an open rural area (Valle Lepri) and one pair of traps for 16 night in 2003 in four urban coastal areas (Po delta, Comacchio).

Each trap was baited with 600 g of dry ice wrapped in ordinary paper.

There was a significant difference between the two types of trap in the total mean collection of the two main species: *Ochlerotatus caspius* and *Culex pipiens*.

No difference was observed in the collection of *Cx. modestus*, *Oc. detritus*, *Aedes vexans*, *Anopheles maculipennis* and *Culiseta annulata* probably due to the small size of the population.

The relationship between trapping efficiency of the two traps is showed separately for the year 2002 and 2003. In both years the new trap model performances resulted significant higher than the old trap performances. Conversion index between the two traps results different for the two years of study and for the different environment.