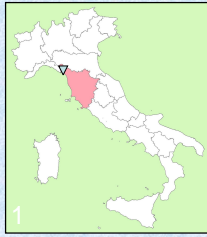


Control plan of the *Coquillettidia richiardii* in Versilia (Italy)

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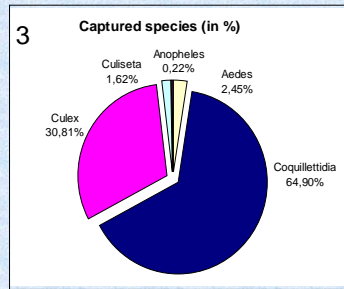


Versilia problem

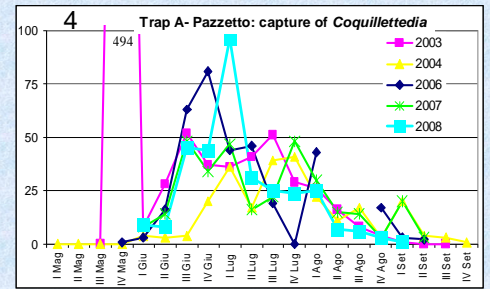
On a national level the *Coquillettidia* is considered a species of little importance and non problematic. In Versilia (Tuscany Italy) (1), in the Forte dei Marmi, Pietrasanta, Montignoso and Seravezza districts (2), in recent years, a large increase in mosquitoes was notified by the citizens. Monitoring the adult mosquitoes with luminous and CO₂ traps (2001-2008), the *Coquillettidia* resulted in 60% to 80% of the captured species (3), with a higher percentage during June and July (4). The nuisance in these touristic areas is due to the invasion of hundreds of individuals during the twilight hours, (sunrise and sunset) more than the specific aggression of the *Coquillettidia*.



Location of luminous and CO₂ traps (red tips) all around Porta Lake.



Year 2006: the C.r. resulted in almost 65% of the total captured species.



Adult of C.r. captured in years 2003- 2008 in trap A.



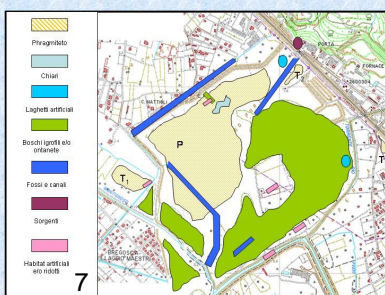
C.r. siphon.

Life cycle

The *Coquillettidia* larva breathes the air found in the arenchyma channels of some aquatic plants, (*Phragmites* sp., *Thypha* sp) attaching themselves with their siphons (5) onto the roots (6). For this reason their development can only be completed in natural wetlands (swamps, lakes and channels) where aquatic plants are constantly under water. On these latitudes they complete only one annual cycle and are in a larva state throughout the winter, while the adults, thanks to their brilliant flight capabilities are able to travel in large groups for more than 10 kms.



Larvae C.r. on the roots of *Phragmites*



Porta Lake habitats

Environmental research

The necessity to solve this problem gave rise to several studies on the breeding sites and on the possible strategies of control. The evident gradual infestation of the territory that emerges from the monitoring (2) lead us to focus our research on the wetlands of the Porta Lake, identified as the principle breeding site for the *Coquillettidia*: the area (7) is characterized by woods, wet grasslands and a surface of 35-40 ha of reed groves (*Phragmites australis* and *Typha* sp.) permanently flooded (8). The research inside the reed groves (9) resulted in a larval population between 16 to 500 larva per m² (average of 175 L/m²) of the *Coquillettidia* in relation to the different water depths, plant species and reed density.

Causes

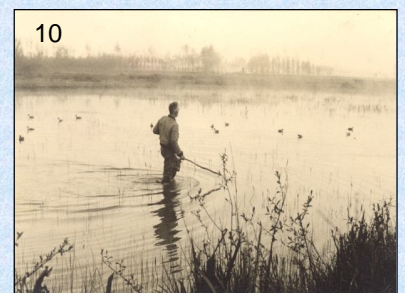
The change in the territory, an increase in the reeds (*Phragmites*) due to the decrease in farming and hunting (10), the stagnant water levels by the hydraulic infrastructures, are the main causes of the intense prolific increase of the *Coquillettidia*.



8 Porta Lake in 2000's



Sampling method of larvae C.r. on the breeding sites



Porta Lake 1920's

Control plan

The control strategies of the *Coquillettidia* to be implemented derived from other experiences that have come about in France, where the cutting down of the reed groves during the winter period resulted in being the most effective method (Guille, 1976; Sérandour, 2006).

Respecting the characteristics of the wetlands, protected nature reserve, and in accordance with the environmental association, the control plan foresees to cut down 10 ha of reeds in the year 2009 (11); simultaneously a study of the water levels will determine a future decision to temporarily dry partial superficial areas. Concerning the insecticides, it has been determined that the biological insecticides (BTI) are not effective for the abundance of organic matter. Meanwhile, Insect Growth Regulator (IGR) indicates the necessary use of a high dose for efficiency but the effects on the non target organisms are not well known. Therefore, taking into consideration the lack of methods of control of the *Coquillettidia*, it has been decided to place various experimental traps to test the efficiency in the capture of large masses of mosquitoes to lower the reproductive level.



Cutting down of the reed groves on *Phragmites* in Porta Lake in 2009