

Prototype Monitoring Device: A new tool to assist the surveillance of invasive mosquito species



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Prototype Monitoring Device

The prototype Invasive Mosquito Species (IMS) Monitoring Device (MD) was designed, developed, tested and optimised by the scientific teams of:

- **TERRA NOVA Ltd.**
- **Benaki Phytopathological Institute**
- **ONEX S.A.**
- **Centro Agricoltura Ambiente “G.NICOLI” S.R.L.**



Prototype Monitoring Device

The use of the prototype MD will provide the scientific community with extended (time series) and reliable data:

- ✓ through significantly simpler procedures for organising the samplings
- ✓ with significantly lower personnel cost
- ✓ with significantly lower travel cost to visit the IMS monitoring site



Prototype Monitoring Device

The prototype MD will promote the process of monitoring & control of adult IMS (and mosquitoes in general) through its innovative operation characteristics, which differentiate it considerably compared to the currently used devices:

- ✓ continuous operation for a period of at least 1 month
- ✓ assisted collection of the samples
- ✓ remote monitoring and control of its operation
- ✓ preservation of the collected samples
- ✓ simultaneous monitoring of the prevailing climatological conditions



Prototype Monitoring Device

The key specifications of the MD are:

- ✓ **Achievement of 95 sampling periods**
- ✓ **Sampling pot with the following features:**
 - light weight
 - manufactured by a recyclable material
 - highly durable in extreme climatological conditions
 - convenient shape in order to circulate inside the MD without jams
 - easily handled when transported
 - low manufacturing cost
- ✓ **Storage compartment of empty sampling pots prior to their use:**
 - minimized use of space
 - adequate storage capacity (95 sampling pots)
 - appropriate architecture to avoid jams



Prototype Monitoring Device

- ✓ **Compartment for storage & preservation of collected samples:**
 - stable temperature environment (0°C - 4°C)
 - adequate storage capacity (95 sampling pots)
 - minimized use of space
 - ergonomical architecture incorporating the refrigerating chamber into the sampling operation



Prototype Monitoring Device

- ✓ **Assisted, non-destructive, mosquitoes samples collection:**
 - adequate air-flow that effectively sucks IMS individuals
 - collected mosquitoes samples remain intact
 - operation with minimized sound emissions and vibrations
 - capacity to use appropriate attractants (lactic acid, CO₂)

- ✓ **Meteorological station for real-time measurement of the climatological conditions at the specific site where the MD is installed:**
 - atmospheric temperature
 - wind direction
 - wind velocity
 - relative humidity
 - precipitation

The meteorological station measures the above parameters every 5 min



Prototype Monitoring Device

- ✓ Remote surveillance & control of the MD via a specialized prototype Network Management System (NMS). The user is able to:
 - monitor the operation of the MD
 - control the operation of the MD
 - schedule the sampling program
 - choose the use or not of attractant CO₂
 - retrieve on-line, and thus on-time, the measured climatological data
- ✓ MD is equipped with various automations that ensures:
 - safe termination of the sampling process in case of power failure
 - re-initiation of the sampling process according to the scheduled plan
 - alarm notifications in cases of:
 - ⊗ non-compatible operation
 - ⊗ undesired conditions



Prototype Monitoring Device

The design concept of the MD aims at the production of reliable data that will enhance, through their statistical analysis, the extraction of exploitable conclusions regarding:

- ✓ the existence of IMS
- ✓ the establishment status of IMS
- ✓ the fluctuations of the IMS populations throughout a specific period of time (e.g. day, week, month)
- ✓ the correlation between the prevailing meteorological conditions and the IMS existence



Prototype Monitoring Device

Scientific community through the use of the MD will acquire access to:

✓ **mosquitoes data:**

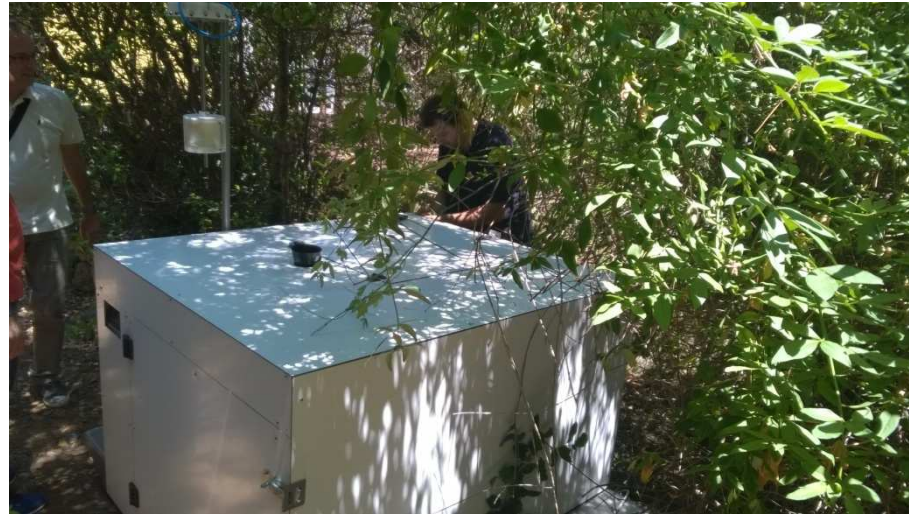
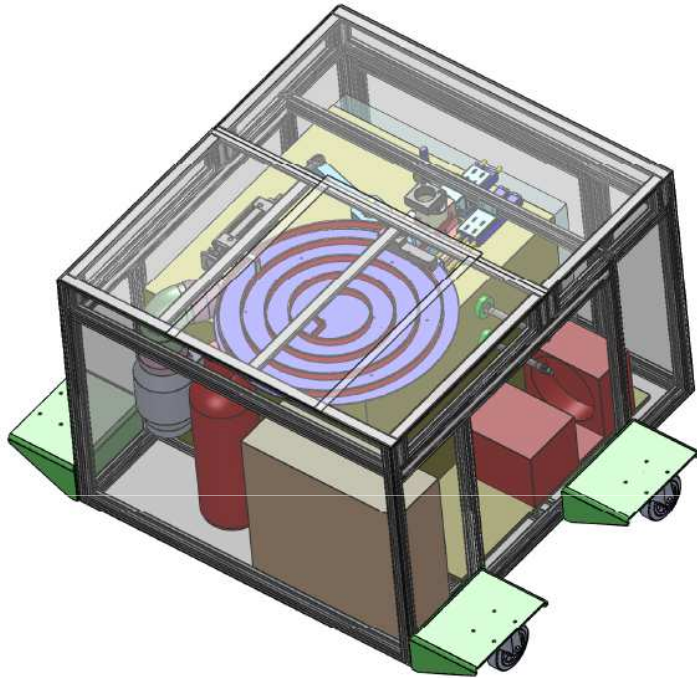
- ✓ for extensive time periods with no requirement for *in-situ* presence of specialised personnel
- ✓ from successive sampling periods

✓ **meteorological data:**

- ✓ for the specific monitoring area
- ✓ for the specific sampling periods



Prototype Monitoring Device



LIFE CONOPS (LIFE12 ENV/GR/000466)



Prototype Monitoring Device

Pilot operation of MDs

- The developed MDs were installed in 12 Pilot Monitoring Areas (PMAs)
- All PMAs were selected based on the “point of entry risk” criterion

Greece	Italy
Eleftherios Venizelos Airport (Athens)	Ravenna Port
Macedonia Airport (Thessaloniki)	Rovereto
Ioannis Daskalogiannis Airport (Chania)	Ancona Port
Patra Port	Centro Agricoltura Ambiente
Piraeus Container Terminal Port	
Mitilini Port	
Benaki Phytopathological Institute	
Democritus University of Thrace	



ITALY - GREECE



Thank you!

