The marine biological laboratory of Concarneau: 150 years of history

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The oldest marine station
(154 years)

Founded in 1859 by Victor Coste, Professor at Collège de France

1807-1873
Past

- in the middle of a region of maritime estuaries with high productivity;
- close to the Glénan archipelago;
- bay of La Forêt is unique and diverse sea grass;
- alternation of rocks and sediments substrates;
- fishing port with high diversity of species.

Why the choice of Concarneau?
Early establishment and concept of fundamental research associated with breeding of animals have made the marine station of Concarneau a model. A major aim is cultivation and farming of marine animals. A model for other stations.
Past

A model for other stations

Roscoff (1871)
Banyuls (1880)
Endoume (1869)
Naples (1872)
Plymouth (1871)
Past

Fishpool built for studying and breeding animals such as turbot, lobster, spiny lobster, and oyster.

Pioneer in aquaculture
successful with oysters;
development of the techniques of the modern oyster farming;

less convincing with crustaceans and fishes (different history of life);
thus laboratory is going to be interested in biology and physiology of organisms.
Past

Satirical cartoon from "Charivari" journal: Professor Coste and his performing fishes

Pioneer in aquaculture
Pouchet: first description of dinoflagellates responsible for the production of toxins

Barrois: embryology of bryozoans

1873-1881: period without director

Marey: swimming of marbled electric ray
Past

Georges Pouchet

1833-1894

1890: construction of the steam rowboat La Perle

numerous and various publications on vision of cirriped, mimicry of the cuttlefish, histology of amphioxus, biology of European pilchard, plankton...

first attempt to monitor pelagic flora and fauna;

Pioneer in physiology of organisms
Past

Giard
famous marine biologist

Laguesse
scientific basis of insulin

Bataillon
conditions of breath in aquatic environment

Pioneer in physiology of organisms
Past

Michelet

Flaubert

French convinced positivist
breeding in controlled conditions since the eggs up to adults; technical developments constitutes the basis for the production of turbot larvae today.

**Past**

**Pioneer in fish farming**

1861-1940

Paul Fabre-Domergue

Common sole

Aquarium for breeding hot-air engine
Laurent Chabry
1855-1893

Chabry’s tool

building and improving micromanipulation devices; his thesis is considered as a founding element of experimental embryology.

Pioneer in developmental biology
After the death of Pouchet (1894), the laboratory of Concarneau is attributed to the Collège de France; laboratory became Laboratoire de Zoologie et Physiologies Maritimes du Collège de France; the first director was Professor Henneguy and his assistant director was professor Fabre-Dommergue.
Past

Pioneer in marine biochemistry

1880-1954

active, learned and prolific scientist

resolved the complicated administrative situation;
restored the station;
built “La Nèreis”.

René Legendre

restored building

cutter «La Nèreis»

Pioneer in marine biochemistry
Past

- gave information on reproduction cycles of Polychaetes and crustaceans due to lamparo fishing cruises;
- made the notion of pH on the map to French people;
- developed techniques of European pilchard drying.

Pioneer in marine biochemistry
Past

Fauré-Fremiet
scleroprotein of fishes

Nicloux
gas assays in biological fluids

Florkin
identify haemoglobin and phosphagens

Roche
active thyroid hormone
identify haemoglobin and phosphagens

Pioneer in marine biochemistry
1925: Commandant Charcot at *Mouton* Island

*Pioneer in marine biochemistry*
Past

Collection

Pioneer in participative sciences?
Past

1968: Y. Le Gal named as assistant director;
1969: new building is built on the place of the former;
1972: opening of the marinarium;

Pioneer in biotechnology
scientist have analysed the biochemical composition and genetic material of organism in order to understand the mechanisms of biological evolution and the relationships between species;

these researches on the biochemical diversity opened the door to the development of marine biotechnology
Now

- 2000: rehabilitated and administrated by the Muséum national d'Histoire naturelle (MNHN);
- 2011: renovation of laboratories, hosting of Ifremer laboratory.

50 permanent lecturer-researchers, researchers, engineers and technicians: MNHN (36) et IFREMER (14).

PhD students, French and foreign under-graduate students participate annually and actively in its activity.
biological models: microalgae, polychaetes, molluscs, echinoderms, fishes

Unit BOREA: biomineralisation, integrative taxonomy, cellular physiology, phylogeography.

Unit 401: benthic ecology, biotechnology.

Unit LER: littoral environment, aquatic resources.
Our research is original.....

Our studies concern organisms from the cell (cellular culture, genetic) to the ecosystem (ecoregionalisation) including the individual ontogeny (models molluscs, echinoderms, and fishes), populations (phylogeography), and species (phylogeny)
Now

Development of effective methods of monitoring the marine environment.

This includes: production of inventory of marine species, study of impact of pollution on living organisms, study and protection of endangered species, better use of fish resources.

2 ecosystems are regularly monitored: the rocky littoral (for the last 40 years) and estuaries.

Research

Laïta estuary

rocky substrate
all these activities have been increasingly relevant to economic activity: fishing, aquaculture, and biotechnologies.

the barcoding of fishes and the traceability of sea products are both major axes of our research on biotechnology.
Now

**Sequencing:**
quantitative PCR, automated extraction, electrophoresis

**Cellular culture**
inverted microscope

**Technical platforms**
sander machine
micrometric saw
Sclerology

**Sclerology**
laminar air flow hood
station of image analysis
Now

scuba diving

trawl

Le Garvel
boat of station

Technical platforms
At national and international level: Natura 2000, Protected Marine Area, European directives (DCE), UICN, CITES.....
exceptional catch of bumpytail ragged-tooth (19 September 2013)

increase museum collections

Collections
Now

the last taxidermist of fishes naturalizes specimens

Collections
Now

- courses to:
  - students from Bachelor's to Master's degree;
  - teachers;
  - fisheries observers.

Teaching

- reception of International masters in marine biology
Marinarium: a showcase of a part our research

- 16000 visitors per year;
- 1 exhibition per year;
- conferences in connection with exhibition;
- workshops.

Outreach
Outreach

Now

special workshop for week of biotechnology
Pioneer in ... 

- pursuit of the current themes such as development biology, dynamics of marine species, evolution of species, monitoring the ecosystems.
- development of integrative ecology to become pioneer;
- development of new approach of embryology to the ontophylogeny to become pioneer.
- the modest size of our station is essentially assets which facilitates the creativity and scientific production of works in dynamics specialized networks.
Thank you for your attention