TEchnological Device for avoiding Parasite Discarding at sea

TEDEPAD-Ship

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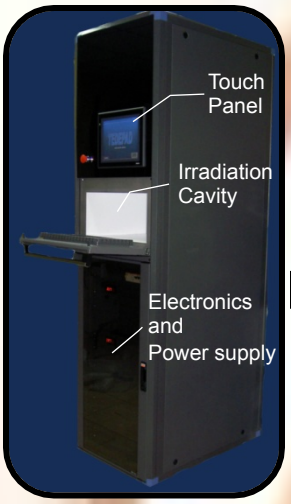
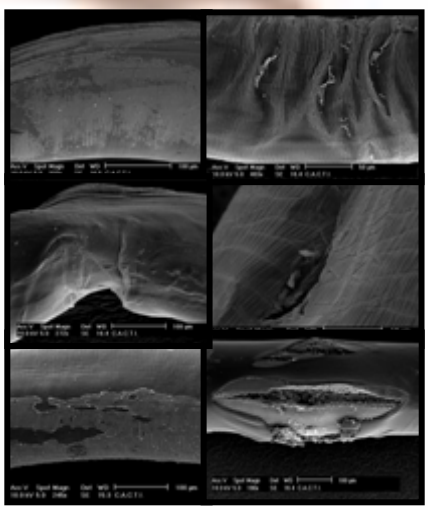
Parasites are an important component of the marine biota. Many taxa have been described associated to significant disease outbreaks in cultured populations, or as an important etiological agent impairing the well-being and marketability of wild exploited fish populations. They are also responsible of emergent fish-borne zoonoses and allergic processes. In spite of their importance, marine parasites are probably the least known group of organisms as tags in technological developments, mainly due to the scientific concern that parasites are so well adapted to the marine ecosystem that they are apparently out of any human control management plan in wild populations. For that reason, in 2006 we created a technological consortium financed by the PGIDIT Programme **(Xunta de Galicia-05RMA00702CT)**, with the aim to introduce a contra-epizootic parasite measure onboard during the gutting and discarding operations in the vessel fleet. The working hypothesis was to reduce the epizootiological values of parasite infections inhabiting fishing grounds by diminishing the recruitment of parasites to host populations once the whole visceral mass is treated by electromagnetic radiation emitted by TEDEPAD-Ship. The technical accurability, ecosystem-health improving and usefulness for fishing industry of TEDEPAD-Ship is exemplified on the important marine macroparasites belonging to Anisakidae.



Experimental RACK for bioassays

DYE EXCLUSION METHOD
Applicability of trypan blue for distinguising live (square) and dead (circle) anisakid larvae after different TEDEPAD treatments

SDS-PAGE
Peptide characterization of crude extract of anisakid larvae after TEDEPAD treatment at 900 W during 60 seconds. Note that in lane 2 (irradiated dead parasites) no bands below 45 kDa were recognized as it was in live parasites (lane 1).

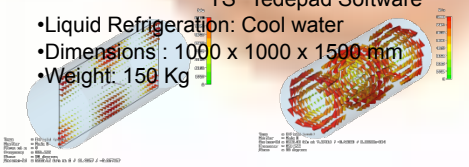


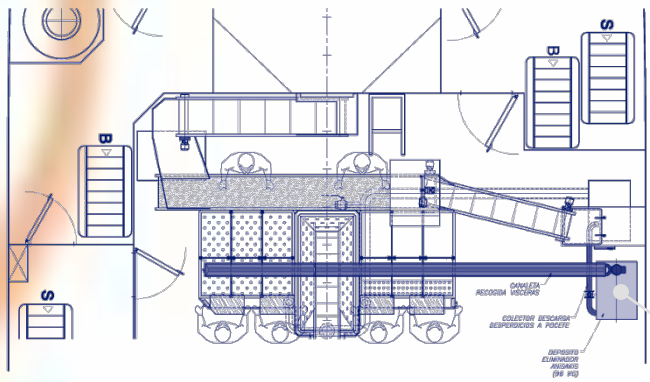
Surface ultrastructural alterations of anisakid larvae (SEM) after different TEDEPAD treatments. Note the dehydrated appearance of dead parasites, presenting coagulated and disrupted zones in the cuticle with release of fluids.

TEDEPAD-Ship:

Technical characteristics

- Power supply: 230 VAC / 50 Hz
- Electric Current: 43 A
- Electric Power: 10 KW/h
- MW Power: 5,4 KW
- (Normative CISPR 11): Class A, Group 2
- CE Certificated equipment
  2004 / 108 CE: EN 61000-6-4 EN 61000-6-2
  2006 / 95 CE: EN 60519-1 EN 60519-6
- Protections: Microprocessor based sensors
- Process Control: Microprocessor Omron TS© Tedepad Software
- Liquid Refrigeration: Cool water
- Dimensions : 1000 x 1000 x 1500 mm
- Weight: 150 Kg





TEDEPAD Ship Installation Drawing

Microwave Generator

CONCLUSION: Under controllable TEDEPAD treatment of offals from fisheries discards all anisakids dead. The highly ordered, multilayered parasite cuticle is broken and their proteins denatured with a 100% efficiency. Thus, this technological device can contributes to reduce the economic and public health impacts of fish parasites at the marine ecosystem level. As an example, only considering the Spanish fleet operating in the Gran Sole It has been estimated that ***TEDEPAD-Ship can reduce the recruitment of over 120 million anisakid larvae per fishing survey. This development could become the basis of a commercial system for fishing fleet overseas.***