



NSERC Canadian Integrated
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CIMTAN *Snippets*

A new cosmetic product from IMTA seaweeds. For two years, **Thierry Chopin** has been working with the company **Exsymol S.A.M.**, from Monaco, on the development of the new cosmetic product **Exsymtal®** based on an extract of the IMTA kelp, *Alaria esculenta*, grown at the IMTA sites of Cooke Aquaculture Inc. in the Bay of Fundy. The applications of the product are based on its anti-aging, anti-pollution/anti-stress, dermis filler and dermis renewal properties. Thierry Chopin visited the company in Monaco and its research & development and production units twice. He was very impressed by the professionalism and openness of the interdisciplinary team, which spans from chemists and molecular biologists, developing new dermo-cosmetological tests on the active principles, to marketing and financial advisors, who are contributing to the positioning of this IMTA valued-added product in the skincare industry.



A fact sheet on the IMTA work in British Columbia has been developed by CIMTAN investigators **Chris Pearce** (Pacific Biological Station, Nanaimo) and **Stephen Cross** (University of Victoria and Kyuquot SEAFoods Ltd., one of the CIMTAN industry partners), with financial support from the Aquaculture Collaborative Research and Development Program (ACRDP) of Fisheries and Ocean Canada.

Read the fact sheet:

<http://www.dfo-mpo.gc.ca/science/enviro/aquaculture/acrdp-pcrda/fsheet-ftechnique/issue-fiche-11-eng.html>

Thierry Chopin was a **keynote speaker** at the **2nd Annual World Congress of Marine Biotechnology 2012 – Ocean, Inspiration and Innovations** and the **1st Annual International Congress of Marine Algae 2012 – New Dimensions for Marine Algae Development**, in **Dalian, China**, in September 2012. His presentation was entitled “Integrated Multi-Trophic Aquaculture (IMTA): an environmentally, economically and societally responsible aquanomic practice for integrated sequential biorefinery production and provision of services to the ecosystem”.



See the announcement of the conference: <http://www.bitconferences.com/wcmb2012/>

Following his presentation, **Thierry Chopin** was interviewed by **Yang Guan**, journalist at **China Central TV CCTV-News**.

Watch the interview: <http://english.cntv.cn/program/newsupdate/20120923/100034.shtml>



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Chris Aerni (Chef and owner of the Rossmount Inn in St. Andrews), Andrew Lively (Director of Marketing of the True North Salmon Company), Cyr Couturier (Memorial University of Newfoundland) and Thierry Chopin (CIMTAN) were on the television documentary "Farmed salmon: is it really a threatening fish?" of the Radio-Canada show L'Épicerie.



Watch the television documentary:

http://www.radio-canada.ca/emissions/l_epicerie/2012-2013/Reportage.asp?idDoc=250776



Thierry Chopin was the October 2012 invited speaker of the "Bacon and Eggheads Breakfast" ("Petit-Déjeuner avec des Têtes à Papineau") series. On October 25, 2012, he gave a presentation entitled "Towards a More Sustainable and Diversified Aquaculture" to members of the House of Commons, Senators, invited government officials, the Natural Science and Engineering Research Council (NSERC), the



Partnership Group for Science and Engineering (PAGSE), the media and invited guests, while they were having breakfast, including IMTA salmon provided by the True North Salmon Company. It was an interesting opportunity to talk about IMTA and the evolution of aquaculture practices to a distinguished and influential audience, which included key decision-makers.

Read about the Bacon and Eggheads Breakfast series: <http://www.pagse.org/en/breakfasts.htm>



Salvador Guerrero (Centro de Investigaci3n Mariñas) and Javier Cremades (Universidade da Coruña) edited a very interesting and nicely illustrated book entitled **Integrated Multi-Trophic Aquaculture – A sustainable, pioneering alternative for marine cultures in Galicia**, which summarizes all the efforts made to develop IMTA in Galicia, Spain, in recent years. There is even a chapter resulting from an interview of Thierry Chopin by Jorge Garcia.



[Read the English version](#)
[Read the Castilian version](#)
[Read the Galician version](#)



Just hot off the ePress... the latest **TED Book** was released on October 25. This multimedia eBook



authored by **Maria Finn** is entitled **"The Whole Fish: How Adventurous Eating Can Improve Your Sex Life and Help Save the Ocean"**, and, yes, 3 pages are dedicated to IMTA!

Here is the brief description of the book. "The "gill to adipose fin" trend means buying fish whole and using the entire animal. Make fish head soup, broil the collars, brine the eggs, relish the fatty bellies, bake the skins for "fish bacon" dry the bones and grind them into a "salt" or smoke them for stock. Learn to love sardines, mackerel and herring for all their wonderful oiliness. You'll get mega doses of omega 3's, serotonin highs, increased stamina and all sorts of other benefits to ramp up your sex life and vastly improve your health. Research has shown that experiencing new things triggers the chemicals, dopamine and norepinephrine - the same ones released when you're newly in love. So make this as simple as an adventurous dinner."

TED Books are multimedia eBooks, longer than an article but shorter than a traditional book. The Whole Fish is available for downloads onto Kindle, Nook, iPad and the TED iPhone app. Price is \$2.99.

At the **World Aquaculture Society 2012** conference in **Prague**, in the **Czech Republic**, a **full-day session** was dedicated to **IMTA**. Seventeen speakers



from 14 countries (Columbia, Norway, South Africa, China, Portugal, Israel, Hungary, New Zealand, Egypt, Germany, Spain, Italy, Canada and Turkey) covered many facets of IMTA and described very different systems, all based on the IMTA concepts and principles.

In the musical city of Prague, where Johann Sebastian Bach founded a theatre, it was appropriate to remind people of the parallel between the music of this prolific

composer and IMTA: IMTA is the central/overarching theme on which many variations can be developed according to the environmental, biological, physical, chemical, societal and economic conditions prevailing in parts of the world where the IMTA systems are operating. It can be applied to open-water or land-based systems, marine or freshwater systems (sometimes called "aquaponics"), and temperate or tropical systems. What is important is that the appropriate organisms are chosen at multiple trophic levels





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based on the complementary functions they have in the ecosystem, as well as for their economic value or potential. Integration should be understood as cultivation in proximity, not considering absolute distances but connectivity in terms of ecosystemic functionalities.



It should be made clear that in the minds of those who created the acronym "IMTA" in 2004, it was never conceived to be viewed only as the cultivation of salmon, kelps, blue mussels and other invertebrates in temperate waters and within a few hundred meters: this is only one of the variations and the IMTA concept can be extended to very large ecosystems like the Yellow Sea. This also means that IMTA variations include integrated agriculture aquaculture (IAA), integrated silviculture (mangrove) aquaculture (ISiA), integrated green water aquaculture (IGWA), integrated fisheries aquaculture (IFA), integrated temporal aquaculture (ITA), integrated sequential

aquaculture (ISA, also called partitioned aquaculture, PA, or fractionated aquaculture, FA), sustainable/sustained ecological aquaculture (SEA), aquaponics or freshwater integrated multi-trophic aquaculture (FIMTA), integrated peri-urban aquaculture (IPUA) and integrated food and renewable energy parks (IFREP). There is no ultimate IMTA system to "feed the world". There is not one world but climatic, environmental, biological, physical, chemical, economic, historical, societal and political conditions, each of which can lead to different choices of systems for feeding these micro-worlds.

Another example of an IMTA system, this time in Bangladesh, was communicated to us by **Dave Conley** (Senior Consultant and Founding Partner of the Aquaculture Communications Group and Executive Director of Aquaculture without Frontiers).

Watch the YouTube video on IMTA in Bangladesh:

www.youtube.com/watch?v=zRMmiDauvs4



Before being a plenary speaker at the 8th Asia-Pacific Conference on Algal Biotechnology, in Adelaide, Australia, last July, **Thierry Chopin** spent a few days with **Pia Winberg**, from the University of Wollongong and the new "Seaweed Dame of Australia". Pia took Thierry to the **Basin View Masonic Village** for a most surprising visit. **Denise Leroy**, General Manager of the care hostel, developed a freshwater IMTA system, with the assistance of **Paul van der Werf** of **EarthanGroup**, for her patients who suffer from different types of dementia. So, here we have a new application for IMTA, this is **Dementia Treating Integrated Multi-Trophic Aquaculture**, or **DTIMTA**. A remarkable idea that works amazingly!

Read the article on DTIMTA: <http://www.unbsj.ca/sase/biology/chopinlab/imta/news/index.html>



Linda D'Anna has been a postdoctoral fellow with CIMTAN at Vancouver Island University under the



supervision of Grant Murray since June 2011. An interdisciplinary ecologist, Linda has a PhD from the University of North Carolina at Chapel Hill. Her research interests focus on the human dimensions of environmental change in coastal systems. Linda is contributing to the investigation of the social implications of IMTA. By studying the distribution of the environmental, social, and economic costs and benefits of the existing aquaculture industry across residents of coastal communities, Linda's work will provide future IMTA developments with the approach, tools, and information for establishing locally contextualized installations. Her approach applies concepts from the social-ecological resilience and well-

being literatures to understanding local perceptions through a case study of the shellfish aquaculture industry in Baynes Sound, British Columbia. She is currently conducting semi-structured interviews and photo-voice with key informants. These qualitative findings will be used to create a questionnaire survey tool to assess the broader distribution of perceptions of the relationships between the industry and local resilience and well-being.

First CIMTAN member quote of the month: "Coastal communities are in the midst of immense environmental and cultural changes. As they continue to experience declines in traditional resource extraction industries, they are seeking alternative activities and industries that still maintain their connection to the sea. The research being done by CIMTAN will help communities make informed decisions about how to forge alternative connections to the sea." (*Linda D'Anna, CIMTAN postdoctoral fellow*).

Janis Webb completed the laboratory phase of a CIMTAN project, examining the potential use of bivalve shellfish to filter sea lice larvae from the water column, for her MSc research at the University of Victoria, British Columbia. The ability of four species of bivalves (basket cockle, Pacific oyster, mussel, Pacific scallop) to ingest the planktonic larvae of sea lice was investigated at the Pacific Biological Station in Nanaimo. The effects of water temperature (5, 10 and 15 °C), presence/absence of phytoplankton, and bivalve size (small, medium, large oysters and scallops) on larval ingestion were examined. The series of experiments clearly showed that all the tested shellfish species consumed significant quantities of sea lice larvae (provided at densities considerably greater than might be found at a salmon farm). Neither water temperature nor the presence/absence of phytoplankton had a significant effect on the quantity of larvae consumed, however, bivalve size did (large shellfish ingested more larvae than small individuals of the same species). Janis received her MSc and is very thankful for the support of CIMTAN for the aforementioned research and also for the network's support in presenting her work at a variety of conferences, culminating in a well-received presentation of her final results at an international





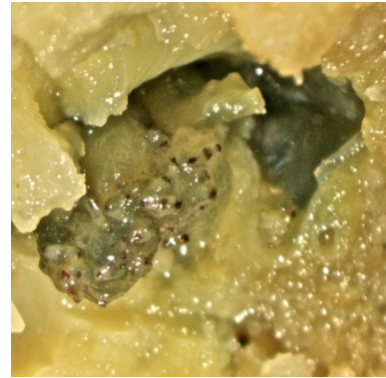
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conference, Sea Lice 2012, in Bergen, Norway. Subsequent to the successful laboratory outcome, a field trial to determine whether or not bivalves grown immediately beside fish net pens can reduce sea lice on salmon is currently underway in British Columbia and is led by Dr. Chris Pearce.

Second CIMTAN member quote of the month: "I am quite optimistic that an IMTA method for using bivalves to help control sea lice on farmed salmon may be developed and could ultimately help reduce the need for chemotherapeutants." (*Janis Webb, CIMTAN MSc*).



Sea lice larvae in the stomach
of a Pacific oyster

Latest news... Haida Gwaii (formerly the Queen Charlotte Islands), in British Columbia, was hit by a magnitude 7.7 M earthquake on October 27, 2012. The IMTA site of our industry partner Kyuquot SEAFoods Ltd., situated around 450 km southeast of the epicenter, did not endure any damage. Interestingly, following the magnitude 7.1 M earthquake of Fukushima, in Japan, on April 11, 2011, the resulting tsunami waves covered a distance of at least 7,300 km, and the Acoustic Doppler Current Profiler (ADCP) deployed in Crowther Channel, next to the IMTA site, was knocked over and stopped recording. Amazing...! A single wave probably entered the narrow passage between Surprise Island and the IMTA site. It was around 30 cm high but its velocity created some interesting eddies. It was a calm day so one could really see how turbulent the water was. It then bounced around the entire Sound for the next 3-4 hours coming back and pushing the system, nets, equipment, etc.