

INDUSTRY RESEARCH NEEDS FROM THE IRLP

Bioactive compounds from seaweeds

The « Seaweed IRLP » consortium

- *Companies in the Consortium*
- *Work Packages*
- *Key points*

COMPANIES IN THE CONSORTIUM

➤ 18 Irish Companies Involved <

Aer Ltd; Algaran; Arramara Teo; BioAtlantis; Blath na Mara; Brandon Products; Corail Feamainne; CyberColloids; CyberColours; Dolphin Sea Vegetables; Irish Seaweed Processors; Lotide Fine Foods; Marigot Ltd; Oilean Glas Teo; Red Bank Hatchery; Ri na Mara; Seavite Bodycare Ltd; Voya

Commercial Sectors

Volume Per Year (wet)

Market Value

Primary Processors
(Seaweed meal, raw products, etc.)

30-35,000 Tons

Low

BioStimulants

Several Thousand Tons

Low to Medium

Animal Feeds

Several Hundred Tons

Medium

Cosmetics/Spas

Several Tonnes

Medium to High

Foods/Health Applications

Several Hundred Kgs

Medium to High

Others:

Bioremediation, Cultivation, Biofuels

No volume scale

No value scale

SPECIES AND SITES OF INTERESTS

Main species commercially utilised

- *Ascophyllum nodosum*
- *Lithothamnion coralloides* (Maerl)
- *Fucus* sp.
- *Laminaria* sp.
- *Chondrus crispus*

Species of interest to develop:

- *Palmaria palmata*
- *Himanthalia elongata*
- *Ulva lactuca*

SITES



.....and any extracts from these species !

COMPANIES IN THE CONSORTIUM

Limits to further commercial development:

- Knowledge of chemical & biochemical composition of the seaweeds

Limited amount of scientific information:

- Validated & replicable techniques for processed samples
- Seasonal & site variations
- Effects of existing industrial processes
- Bioactivity of key components
- Stability
- Contaminants

Common Basic Need For:

- *Safety Data & REACH*
- *Market claims*
- *National and International Regulations*
- *Traceability*

WORK-PACKAGES OF THE PROGRAM

WORK-PACKAGE A: *A STATUS OF KNOWLEDGE*

Review of existing knowledge on selected species:

- Ecophysiology
- Biomass in Ireland
- Chemical & Biochemical Composition (local and international)
- Known bioactive compounds
- Potential variations and explanations
- Analytical techniques
- Industrial extraction techniques

Interactive database with

- Summarized outcome of the review
- Bibliography of reports, reviews and publications
- Provide a list of current relevant research/analytical providers

WORK-PACKAGES OF THE PROGRAM

WORK-PACKAGE B: *The raw material, its analysis, its potential*

Goals well defined in the Proposals

Key Components:

- Minerals (calcium/maerl)
- Soluble and insoluble fibres
- Alginates
- Laminarin, fucoidans, mannitol
- Vitamins
- Antioxidants
- Amino acid profile
- Lipids
- Fatty acid profile
- Pigments
- Phenolic compounds
- Plant-Hormone “like” molecules

Key “Contaminants”

- Mycotoxins
- PCBs
- Dioxins
- Arsenic (arsenosugars)
- Heavy metals
- Iodine (food, cosmetics/Colipa)

For each compound:

- Validate best analytical techniques (characterisation, effect, etc.)*
- Study variations over a year (potential yields and best harvesting time)*
- Relation between site/yields (exposure, depth, salinity, sea temperature)*
- Establish bases of centre/network of excellence to carry relevant analyses*

WORK-PACKAGES OF THE PROGRAM

WORK-PACKAGE C: The processes, their effects and new techniques

Goals well defined in the proposals

Same compounds will be investigated

- ***Validation of analytical techniques on processed samples***
(samples provided by participating companies)
- ***Understand effects of industrial processes on investigated compounds:***
 - *alkaline and acid extraction, finished product pH, drying, formulations*
 - *investigate yield, quality and effect of process on bioactivity*
 - *link yield of various components of the extract to raw material source*
- ***Stability of the investigated compounds over time***
 - *Investigate methods to stabilise & increase the shelf-life of sensitive compounds*
- ***Investigate the potential of other new extraction techniques***
 - *Low temperature drying,*
 - *Sterilisation,*
 - *Supercritical extraction,*
 - *Ionisation, pressure etc...*

Potential to develop a complete analytical service in Ireland (GEP, GLP, ISO, etc.)

ADDITIONAL KEY COMMENTS

Bioactivity

- Develop rapid assay to assess effects of extracts or compounds on plant, animal & human systems
- *In vitro* or *In vivo*? Setup bases for further clinical trials?
- Can we claim additional effects ? Initiate commercial trials?

Processes

- Most economically and commercially relevant to further develop existing and novel applications?
- Think waste management

Traceability

- Link efficacy of extracts to harvesting area
- Complete traceability from harvest to finished product

Note:

- Multidisciplinary collaboration is advised: *Plant extracts, food experts?*
- Constant feedback of the research consortium to EI & Industry
- Milestones and deliverables according to the work plan and on time