



UNIVERSITÀ
DEGLI STUDI
FIRENZE

FLORE

Repository istituzionale dell'Università degli Studi di Firenze

In vitro safety assessment of microalgal and cyanobacterial strains of interest as food ingredients

Questa è la Versione finale referata (Post print/Accepted manuscript) della seguente pubblicazione:

Original Citation:

In vitro safety assessment of microalgal and cyanobacterial strains of interest as food ingredients / Niccolai, A.; Biondi, N.; Bigagli, E.; Luceri, C.; Cinci, L.; Rodolfi, L.; Tredici, M.R. - STAMPA. - (2015), pp. 225-225. (AlgaEurope 2015 Lisbon (Portugal) 1-3 December 2015).

Availability:

The webpage <https://hdl.handle.net/2158/1051760> of the repository was last updated on 2016-09-08T17:05:28Z

Publisher:

EABA, EC, DLG

Terms of use:

Open Access

La pubblicazione è resa disponibile sotto le norme e i termini della licenza di deposito, secondo quanto stabilito dalla Policy per l'accesso aperto dell'Università degli Studi di Firenze (<https://www.sba.unifi.it/upload/policy-oa-2016-1.pdf>)

Publisher copyright claim:

La data sopra indicata si riferisce all'ultimo aggiornamento della scheda del Repository FloRe - The above-mentioned date refers to the last update of the record in the Institutional Repository FloRe

(Article begins on next page)

IN VITRO SAFETY ASSESSMENT OF MICROALGAL AND CYANOBACTERIAL STRAINS OF INTEREST AS FOOD INGREDIENTS

**Alberto Niccolai¹, Natascia Biondi¹, Elisabetta Bigagli²,
Cristina Luceri², Lorenzo Cinci², Liliana Rodolfi^{1,3}, Mario R. Tredici¹**

Microalgae (including cyanobacteria) have since long been recognized as potential sources of food, due to their balanced biochemical composition and high nutritional value. The general objective of the present research was to evaluate the toxicity of 13 microalgal strains, selected as potential food ingredients, in two *in vitro* models: human dermal fibroblasts and *Artemia salina*.

Methanolic and aqueous extracts of the biomasses were tested on *A. salina* at concentrations ranging from 0.024 to 25 g L⁻¹. Only aqueous extracts (from 0.5 to 12.5 g L⁻¹ of extracted biomass) were tested on fibroblasts. The methanolic extracts of *Arthrospira platensis* M2, *Nostoc commune* var. *sphaeroides* F&M-C117, *Chlorella vulgaris* (Roquette), *Chlorella vulgaris* (Allma), starved *Tetraselmis suecica* F&M-M33, *Nannochloropsis oceanica* F&M-M24 and *Porphyridium cruentum* F&M-M46 were found to have no toxicity on *A. salina*. The methanolic extracts of *Chlorella sorokiniana* F&M-M49, *Phaeodactylum tricornutum* F&M-M40 and *Tetraselmis suecica* F&M-M33 grown in nutrient replete medium showed toxicity only at the highest concentrations (12.5 - 25 g L⁻¹ of extracted biomass), while the extracts from Alga Klamath (*Aphanizomenon flos-aquae* bloom), *Isochrysis* aff. *galbana* T-ISO F&M-M36 and *Chlorella sorokiniana* IAM C-212 were toxic even at low concentrations (0.8 g L of extracted biomass). On *A. salina*, the aqueous extracts of *N. commune* var. *sphaeroides* F&M-C117, *N. oceanica* F&M-M24, *P. cruentum* F&M-M46 and all the Chlorophyta showed no toxicity. *I. aff. galbana* T-ISO F&M-M36, *A. platensis* M2 and *P. tricornutum* F&M-M40 were found to be toxic at 12.5 and 25 g L⁻¹ of extracted biomass. The extract from *A. flos-aquae* was found to be toxic at concentrations higher than 0.8 g L⁻¹ of extracted biomass.

On fibroblasts, *C. vulgaris* (Roquette), *C. vulgaris* (Allma), starved *T. suecica* F&M-M33 and *P. cruentum* F&M-M46 showed no cytotoxicity compared to the control; on the contrary, all the other strains exhibited signs of cytotoxicity, mainly at the highest concentrations. *Artemia* and fibroblasts are valuable models for preliminary screening of toxicity. However, results obtained with these *in vitro* screenings need to be confirmed with *in vivo* systems.

¹Department of Agrifood Production and Environmental Sciences (DISPAA), University of Florence, Piazzale delle Cascine 24, 50144 Florence, Italy

²Department of NEUROFARBA, section of Pharmacology and Toxicology, University of Florence, Viale Pieraccini 6, 50139 Florence, Italy

³Fotosintetica & Microbiologica S.r.l., Via dei Della Robbia 54, 50132 Florence, Italy



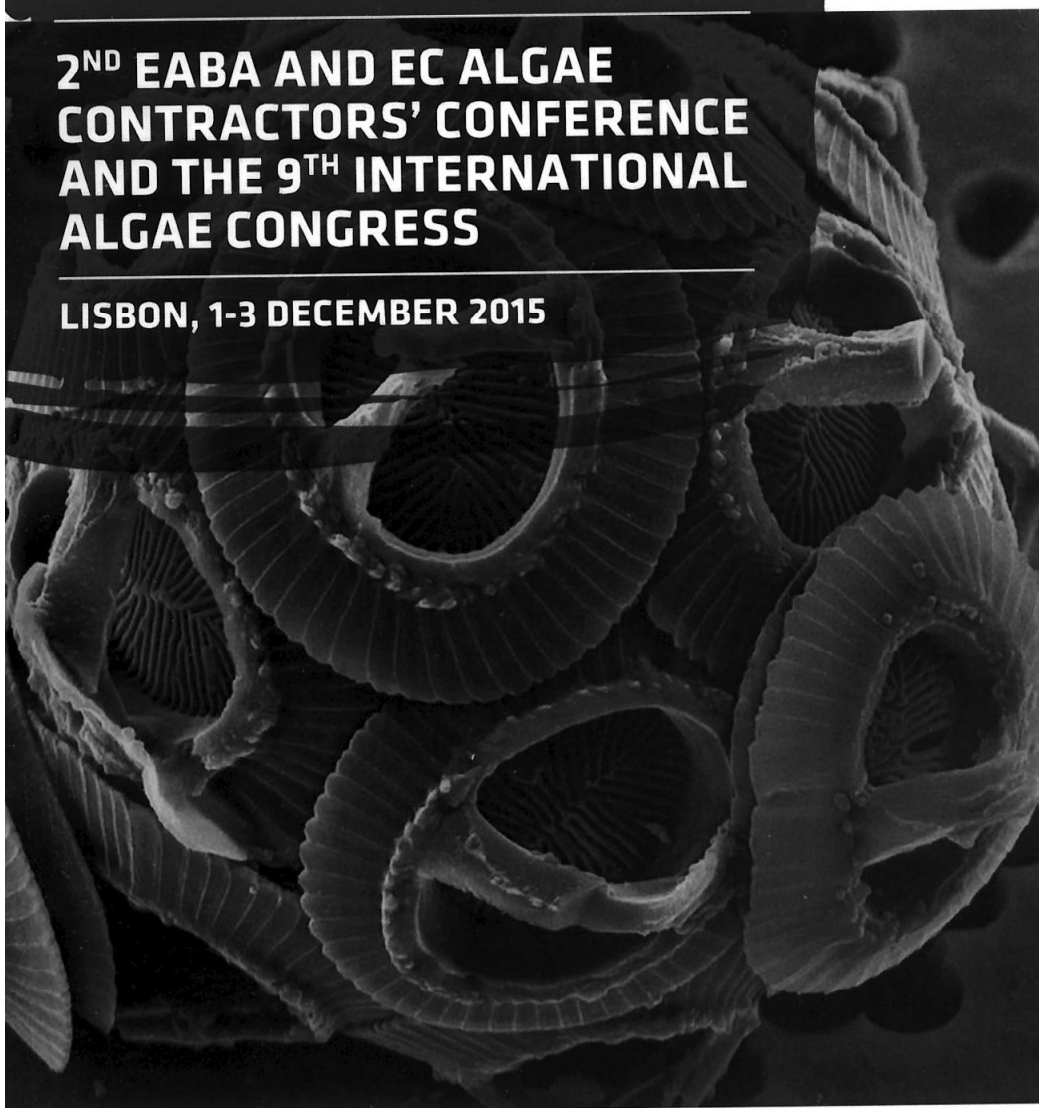
1-3 DECEMBER 2015
9th International
Algae
congress

ALGAEUROPE
CONFERENCE 2015

BOOK OF ABSTRACTS

**2ND EABA AND EC ALGAE
CONTRACTORS' CONFERENCE
AND THE 9TH INTERNATIONAL
ALGAE CONGRESS**

LISBON, 1-3 DECEMBER 2015



algaecongress.com

