12th INTERNATIONAL CONFERENCE ON MODERN AND FOSSIL DINOFLAGELLATES

DINO12

CERTIFICATE OF ATTENDANCE

FRANCESCO PISAPIA

Has participated on the 12th International Conference on Modern and Fossil Dinoflagellates - DINO12, held in Las Palmas de Gran Canaria (Canary Islands – Spain) from 4th to 8th, 2022.

Dr. Emilio Soler Onís
Chair of 12th International Conference on Modern ad Fossil Dinoflagellates

12th INTERNATIONAL CONFERENCE ON MODERN AND FOSSIL DINOFLAGELLATES

Las Palmas de Gran Canaria
Canary Islands, SPAIN
July, 4th- 8th 2022

Book of Abstracts

Book of Abstracts

12th INTERNATIONAL CONFERENCE ON MODERN AND FOSSIL DINOFLAGELLATES

Conference Centre of the Canary Islands

Auditorio Alfredo Kraus

Las Palmas de Gran Canaria

July, 4th – 8th 2022

Organised by

OCHABs

Observatorio Canario de algas nocivas

Drawings: Alicia Ojeda Rodríguez (1998). Photographs: Emilio Soler Onís (2022)

3.08 Assessment of the growth and toxicity of different strains of *Gambierdiscus* sp.

Yefermin Darias-Dágfeel[*1], Francesco Pisapia[2], Francesca Cucchi[2], Juan Luis Gómez-Pinchetti[2], Antera Martel[2], Freddy Silva Sergent[1], Andrés Sánchez- Henao[1], Natalia García-Álvarez[1] and Fernando Real[1]

[1]Division of Fish Health and Pathology, University Institute of Animal Health and Food Safety (IUSA), University of Las Palmas de Gran Canaria, 35416 Arucas, SPAIN.
yefermin.darias101@alu.ulpgc.es, freddy.silva101@alu.ulpgc.es, julian.sanchez101@alu.ulpgc.es, natalia.garcia@ulpgc.es, fernando.real@ulpgc.es

[2]Spanish Bank of Algae, University of Las Palmas de Gran Canaria, Muelle de Taliarte s/n, 35214 Telde, SPAIN
francesco.pisapia@fpct.ulpgc.es, francesca.cucchi.pagani@gmail.com, juan.gomez@ulpgc.es, antera.martel@ulpgc.es

Abstract: Microalgae of the genus *Gambierdiscus* are producers of precursors of ciguatoxins (CTXs), which bioaccumulate in the marine trophic chain and are responsiblefor ciguatera fish poisoning in humans. Ciguatera is a foodborne illness typically knownas a tropical disease, but ciguatera cases are being increasingly reported in the North- Eastern Atlantic. The appearance of fish contaminated with CTXs has become more andmore common in areas such as the Canary Islands, but the mechanisms underlying the bioaccumulation and biotransformation of the CTXs in this region are still poorly discerned (Soliño & Costa, 2020).

The study presented here is part of the European project “Ciguarisk” and has the objective to assess cell growth and toxin production of two *Gambierdiscus* strains from the Atlantic region selected for fish feeding experiments, i.e., *G. excentricus* IRTA-SMM-17-429 and *G. carolineanus* BEA1923. Cell growth was performed in culture flasks under the same culture conditions, using a semi-continuous batch approach. The culture method is aimed to harvest the highest biomass production possible for use in dietary exposure experiments in fish. Two culture media (L1 and F2) were evaluated for their influence on the growth of the strains. Both media were suitable for culturing *Gambierdiscus*, although some slight differences were observed in growth rates and cell behaviour. *G. excentricus* IRTA-SMM-17-429 presented slower growth with respect to *G. carolineanus* BEA1923 in all conditions tested. Ciguatoxins were extracted from fresh biomass samples and pre-purified using liquid-liquid partitioning. CTX-like toxicity of the strains was screened using the neuroblastoma neuro-2a assay (Caillaud *et al*., 2010). Preliminary data suggest that *G. excentricus* IRTA-SMM-17-429 is more toxic than *G. carolineanus* BEA1923.

These results presented in this study are in accordance with previous studies on other strains of *G. carolinianus* and *G. excentricus* (Pisapia *et al*., 2017). Further studies will focus on culture optimization and scale-up, quantitation of the toxic content, and micro-encapsulation of the biomass for the feeding experiments. The results obtained from this project will ultimately help to a better understanding of the bioaccumulation and biotransformation of CTXs in the food chain in the Atlantic region.

Keywords: Ciguatoxins, *Gambierdiscus*, toxicity, bioaccumulation, food chain

References:

Caillaud, A., Yasumoto, T., & Diogène, J. (2010). Detection and quantification of maitotoxin-like compounds using a neuroblastoma (Neuro-2a) cell based assay. Application to the screening of maitotoxin-like compounds in *Gambierdiscus* spp. *Toxicon*, *56*(1), 36–44. https://doi.org/10.1016/J.TOXICON.2010.03.012

Pisapia, F., Holland, W. C., Hardison, D. R., Litaker, R. W., Fraga, S., Nishimura, T., Adachi,M., Nguyen-Ngoc, L., Séchet, V., Amzil, Z., Herrenknecht, C., & Hess, P. (2017). Toxicity screening of 13 *Gambierdiscus* strains using neuro-2a and erythrocyte lysis bioassays. *Harmful Algae*, *63*, 173–183. https://doi.org/10.1016/J.HAL.2017.02.005

Soliño, L., & Costa, P. R. (2020). Global impact of ciguatoxins and ciguatera fish poisoningon fish, fisheries and consumers. *Environmental Research*, *182*. https://doi.org/10.1016/J.ENVRES.2020.109111