



FIGEMA

Diet and performance in the scallop, *Argopecten purpuratus*: force production during escape responses and mitochondrial oxidative capacities

Helga Guderley^{1,2,a}, Katherina Brokordt², Hernán M. Pérez Cortés^{1,2}, Yanic Marty³ and Edouard Kraffe³

¹ Département de biologie, Université Laval, Québec, P.Q. Canada G1K 7P4, Canada

² CEAZA (Centro de Estudios Avanzados en Zonas Áridas), Facultad de Ciencias de Mar, Universidad Católica del Norte, Coquimbo, Chile

³ Laboratoire des Lipides marins, UMR CNRS 6521, Université de Bretagne occidentale, CS 93837, 29238 Brest Cedex 3, France

Received 8 February 2011; Accepted 16 May 2011

Abstract – We examined whether escape response performance and mitochondrial capacities could reveal differences created by feeding scallops, *Argopecten purpuratus*, mono-specific algal diets composed of either *Chaetoceros calcitrans* or *Isochrysis galbana* (variety *T. iso*) hereafter *T. iso*. Before and after feeding scallops with these diets, we assessed force production in vivo to evaluate escape response performance (initial and repeat). We measured oxidative capacities of mitochondria isolated from the adductor muscle and from the male and female portions of the gonad. Initial escape response performance was reduced more by the *C. calcitrans* diet than by the *T. iso* diet. Repeat escape responses, which require aerobic recuperation, were reduced by both treatments. The oxidative capacity of mitochondria isolated from muscle and female gonad was markedly lower in scallops fed *C. calcitrans* than in those fed *T. iso*. Flux through complex I–IV and through complex IV was also lower in mitochondria from muscle of scallops fed *C. calcitrans* than in those fed *T. iso*. Muscle aerobic capacity, assessed by citrate synthase activity, was lower in scallops fed *C. calcitrans* than in those fed *T. iso*. Despite the marked differences in fatty acid (FA) composition of the algal diets, the FA composition of mitochondrial phospholipids differed little between scallops fed *C. calcitrans* and those fed *T. iso*. Both escape response behaviour and mitochondrial capacities changed with feeding mono-specific diets. The simplicity of measurements of scallop escape responses suggests this as a practical means of evaluating the status of scallops for the two monoalgal diets tested.

Key words: Escape response / Contractile properties / Mitochondrial capacities / Adductor muscle / Gonad / Fatty acid / Algal diet / Pectinidae