

Scientific Note

EXTRACT OF SEA LETTUCE *ULVA* REDUCES OXYGEN CONSUMPTION OF ABALONE (*HALIOTIS DIVERSICOLOR SUPERTEXTA* LISCHKE)¹

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The culture of small abalone (*Haliotis diversicolor supertexta* Lischke) has received much attention in recent years in Taiwan. Farmers feed the abalone mostly with fresh or dry *Ulva*, a seaweed, which is harvested from the intertidal rocky terraces. It had been observed that while the algae were added into the aquarium, the abalone responds immediately by protruding its cephalic tentacles and moves toward it. It is assumed, therefore, that some substance within *Ulva* is probably sensed by the abalone and triggers the feeding behavior. In order to determine this feeding response, an *Ulva* extract was prepared by soaking 25 g dry weight of *Ulva* in 1 liter of sea water for 1 hr, and filtrated.

When the *Ulva* extract was added to the aquarium, the feeding behavior mentioned above immediately occurred, meanwhile, the oxygen consumption of the animal decreased sharply, as shown in Fig. 1A. The abalone used in this example had been acclimated to a natural diel light cycle for more than 50 days.

Oxygen consumption was measured using the method described by the authors⁽¹⁾, every 30 minutes during the experiment. All the experiments were carried out at 20°C and 500 lux. The *Ulva* extract was added twice to the

flow-through system, 200 ml in total volume.

As the extract was added to the water system, the oxygen consumption rate began to decline and then followed by an overshoot effect (Fig. 1A). When the extract was added again, the oxygen consumption rate declined coincidentally, but soon reestablished. (The degree of reestablishment in oxygen consumption level varied in different size groups and lasted for about 90 min, thereafter, the oxygen consumption declined gradually but recovered at the end of measurements.)

The respiratory response to the *Ulva* extract of abalone previously acclimated to a dark environment for more than 50 days, was somewhat like that of natural light acclimated ones (Fig. 1B), except that a further-increase in oxygen consumption was found during the first 30 min. following the first application. This difference may be related to a different sensibility of abalone toward the treatment resulted from various acclimations.

REFERENCE

1. JAN, R. Q., K. T. SHAO and K. H. CHANG (1980) A study of diurnal periodicity in oxygen consumption of the small abalone. *Bull. Inst. Zool., Academia Sinica* 20 (1): 25-32.

1. Paper No. 217 of the Journal Series of the Institute of Zoology, Academia Sinica.

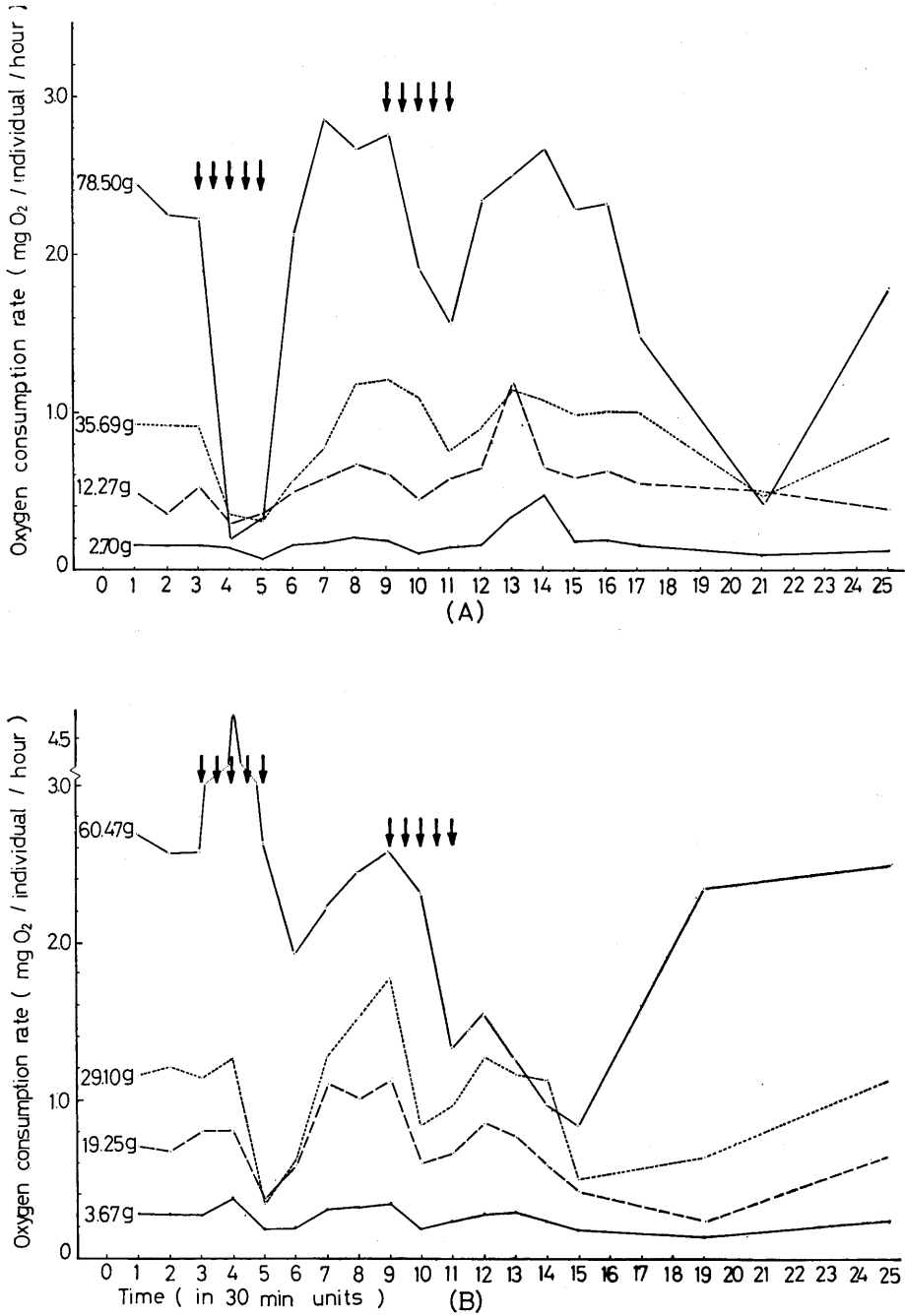


Fig. 1. Oxygen consumption of four size groups of (A) natural light acclimated, and (B) darkness acclimated abalone, with addition of *Ulva* extract to the water system, an arrow shows an addition of 20 ml extract.

石蓴藻浸出液導致九孔耗氧量下降之記要

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經分別以適應於自然光照變化及適應於暗處的九孔 *Haliotis diversicolor supertexta* Lischke 為材料，探討石蓴藻 *Ulva* sp. 浸出液對九孔耗氧量的影響，發現上述浸出液會導致九孔耗氧量的急劇下降，但是當海水中該浸出液的濃度降低時，耗氧量會逐漸恢復。此種現象不因九孔個體的大小而異，但略受九孔的適應光照所影響。