

**OXYGEN CONSUMPTION OF JUVENILE ANTARCTIC NOTOTHENIIDAE FISH
NOTOTHENIA CORIICEPS AND *GOBIONOTOthen GIBBERIFRONS* AND THE
STRUCTURE OF THE RESPIRATORY LAMELLAE OF THE GILLS**

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Notothenia coriiceps (*N. neglecta* morph) and *Gobionotothen gibberifrons* juveniles show different levels of activity: *N. coriiceps* is more active than *G. gibberifrons*, swimming for a wider distance in the water column, with faster movements, and using a wider range of feeding strategies. Accordingly, the question was if there would be a difference in their oxygen consumption, and if it would correspond to differences in the morphology of their respiratory lamellae that could be responsible for facilitating the absorption of oxygen. Individuals of both species were placed individually in sealed chambers that contained seawater kept at temperature 1.4°C, pH 10.6, salinity 34.5‰, and 140.3mmHg of dissolved oxygen (measured continuously by means of a Clarke electrode connected to an oxygen polarograph). For the morphological study the second right gill arches were dissected out and prepared routinely for optical and electron microscopy. The differences in the oxygen consume of both species are significant: *G. gibberifrons* (mean StL 11.1cm; mean weight 3.8g) consumed 70.1mmHg/hr while *N. coriiceps* (mean StL 12.8cm, mean weight 4.0g) only consumed 14.0mmHg of dissolved oxygen in the same time. *G. gibberifrons* took 55% of the available oxygen in the first hour, while *N. coriiceps* extracted only 10%. After two hours, *G. gibberifrons* had extracted 100% of the available oxygen, while *N. coriiceps* still had 50% of the oxygen available, consuming 100% after 5 hours. When returned to well aerated water *N. coriiceps* recovered immediately, while *G. gibberifrons* took a long time to recover and 30% of the individuals perished after the test. The gills of *N. coriiceps* showed less primary lamellae/mm² than *G. gibberifrons* but both supporting approximately the same number of respiratory lamellae, and the same distance for oxygen diffusion. The only significant difference was the number of goblet cells/mm² in the respiratory lamellae that was the double in *G. gibberifrons* than in *N. coriiceps*. It seems that *N. coriiceps* have better chances to survive to decreases in the level of environmental oxygen than *G. gibberifrons*, and that there is no morphological adaptation of the gills related to it.