

# Axillary gland secretions contribute to the stress-induced discharge of a bactericidal substance in *Corydoras sterbai* (Callichthyidae, Siluriformes)

Sekrete der Axillardrüsen von *Corydoras sterbai* (Callichthyidae, Siluriformes) sind Bestandteil einer bei Stress abgegebenen bakteriziden Substanz

Ernst Kiehl, Claudia Rieger, and Hartmut Greven

Institut für Zellbiologie und Zoomorphologie der Heinrich-Heine-Universität Düsseldorf, Universitätsstr. 1, D-40224 Düsseldorf, Germany; grevenh@uni-duesseldorf.de

**Zusammenfassung:** Das von mehreren *Corydoras sterbai*-Individuen während eines Transports ins Wasser abgegebene Sekret wirkt hemmend auf die Lichtemission von *Vibrio fischeri*. In einer SDS-PAGE dieser Sekrete und der isolierten Axillardrüse finden sich übereinstimmende Banden mit einer molekularen Masse von etwa 72,000; 26,000; and 21,700 D. Dies zeigt, dass die Welse bei Beunruhigung auch Axillardrüsensekret ins Wasser abgeben. In welchem Masse dieses an der nachgewiesenen Bakterizidie beteiligt ist, bleibt zu untersuchen.

**Schlüsselwörter:** Axillardrüsen, Callichthyidae, *Corydoras*, bakterizide Eigenschaften

**Summary:** Secretions discharged in the water during transport by some individuals of *Corydoras sterbai* reduce light emission of the bacterium *Vibrio fischeri*. SDS-PAGE of these secretions and of the isolated axillary-gland shows three identical lanes with molecular masses of approx. 71 000, 26 000 and 21 700 D. This suggests that during stress also secretions of the axillary glands were exuded into the water. The contribution of axillary gland secretions to the bactericidal properties remains to be shown.

**Key words:** axillary glands, Callichthyidae, *Corydoras*, bakterizidial properties

## 1. Introduction

*Corydoras* spp. under stress, e.g. during transport or after catching in the wild or in the aquarium, obviously discharge substances that are harmful to conspecifics and other fishes; this was repeatedly described by aquarists and tradesmen (e.g. Evers 2002, Schäfer 2003). In addition, severe pain is reported by people when injured by pectoral spines of *Corydoras* spp. Generally, in Siluriformes toxic secretions arise (1) from unicellular glands in the epidermis called club cells (see Whitear and

Mittal 1983; unpublished observations), (2) from gland cell aggregations surrounding the first pectoral fin ray and/or (3) from axillary glands that occur in some taxa. Toxic properties of the epidermal glands of catfish have been thoroughly studied, but information of axillary glands is poor (for review see Perrière and Goudey-Perrière 2003).

Recently we described the presence of large axillary glands in the catfish *Corydoras aeneus* (Callichthyidae) (Greven et al. 2006). In the present note we give some evidence that secretions from these glands in the re-