# *Thermichthys* (Bythitidae), replacement name for preoccupied *Gerhardia* Nielsen & Cohen, 2002 and a second specimen of *Thermichthys hollisi* from the Southeast Pacific

by

Jørgen G. NIELSEN (1) & Daniel M. COHEN (2)

**ABSTRACT**. - A replacement name, *Thermichthys*, is suggested for the preoccupied, monotypic fish genus, *Gerhardia* Nielsen & Cohen, 2002. A second specimen of *Thermichthys hollisi* (Cohen, Rosenblatt & Moser, 1990) caught at the hydrothermal vent site Hobbs is here described and compared to the holotype from the Galapagos Rift Zone about 4000 km northeast of Hobbs. The new specimen is a male but otherwise there is hardly any difference between the two specimens.

**RÉSUMÉ**. - *Thermichthys* (Teleostei, Bythitidae), nom de remplacement pour *Gerhardia* Nielsen & Cohen, 2002 déjà utilisé, et deuxième spécimen de *Thermichthys hollisi* du Pacifique sud-est.

Un nouveau nom, *Thermichthys*, est proposé pour remplacer celui, déjà occupé, du genre monotypique *Gerhardia* Nielsen & Cohen 2002. Un deuxième spécimen de *Thermichthys hollisi* (Cohen, Rosenblatt & Moser, 1990), capturé sur le site hydrothermal Hobbs, est décrit ici et comparé à l'holotype provenant de la zone de la ride des Galápagos située environ à 4000 km au nord-est de Hobbs. Le deuxième spécimen est un mâle, mais il est très difficile de trouver une différence entre les deux spécimens.

Key words. - Bythitidae - *Thermichthys* nom. nov. - *Thermichthys hollisi* - PSE - South East Pacific Rise - Hydrothermal vent Hobbs - Second record.

While preparing a note proposing a new name for the preoccupied monotypic fish genus *Gerhardia,* a second specimen of *G. hollisi* was caught almost 4000 km from the type locality. A new generic name and a comparison of the two specimens are given below.

## *THERMICHTHYS* NOM. NOV.

Nielsen and Cohen (2002) proposed the genus *Gerhardia* for *Bythites hollisi* Cohen, Rosenblatt & Moser, 1990. The name is preoccupied in beetles (Coleoptera) by *Gerhardia* Kistner, 1960. We here propose a replacement name, *Thermichthys*, referring to the habitat of the type species, the hydrothermal vents along the Galapagos Rift Zone. The type species is the only species thus far referred to this genus.

## *THERMICHTHYS HOLLISI* (COHEN, ROSENBLATT & MOSER, 1990)

The French BIOSPEEDO (Biologie - Sud Pacifique Est - Étude de la dorsale océanique) cruise to the South East Pacific Rise caught at the hydrothermal vent site Hobbs a fish (Fig. 1) that turned out to be the second known specimen of *Thermichthys hollisi*. The comparison between the two specimens (in "Description" and table I) made below convincingly shows that they are conspecific. The new specimen is an adult male and the holotype a gravid female.

### Material examined

*Holotype*. - SIO 88-97, SL 304 mm, ♀, hydrothermal vent (mussel bed) on the Galapagos Rift Zone, 0°47.894'N, 86°9.210'W, Alvin dive 2026, 2500 m, taken in net held by the manipulator arm, 28 Apr. 1988, collected by R. Hollis, R. Hessler & J. O'Brien.

*Non-type*. - MNHN 2004-2039, SL 218 mm, ♂, hydrothermal vent site Hobbs, 17°35.20'S, 113°14.75'W, BIOSPEEDO cruise, PL 1588, 2598 m, baited trap, 29 Apr. 2004, collected by D. Jollivet.

### Description

In table I the two specimens are compared. They are so similar in meristic and morphometric characters that they obviously belong to the same species. A comparison between the new specimen and the thorough general description of the holotype (in brackets) only shows two relevant discrepancies:

(1) Zoological Museum, Universitetsparken 15, 2100 Copenhagen Ø, DENMARK. [JGNielsen@zmuc.ku.dk]
(2) California Academy of Sciences, Golden Gate Park, San Francisco, CA 95521, USA.

Figure 1. - *Thermichthys hollisi*, MNHN 2004-2039, SL 218 mm taken on board immediately after capture (P. Briand photos). *[Photographies réalisées à bord immédiatement après la capture (photos P. Briand).]*

1) Premaxillary teeth poorly developed compared to maxillary teeth (premaxillary and maxillary teeth equally well developed). 2) No pseudobranchial filaments (one filament).

Figure 1 taken immediately after the specimen came on deck shows a bright red snout, lips, margin of pectoral and vertical fins and a darker red body and head. The description of the holotype one year after the capture says "colour in alcohol a dingy dark grey", but photos f. inst. in Lutz and Hessler (1983) show a pink fish.

The copulatory organ is an integrated part of the fleshy genital hood, with the intromittent organ present as a small, soft papilla typical for the bythitid subfamily Bythitinae and for the tribe Brosmophycini of the Brosmophycinae (Møller *et al*., 2004).

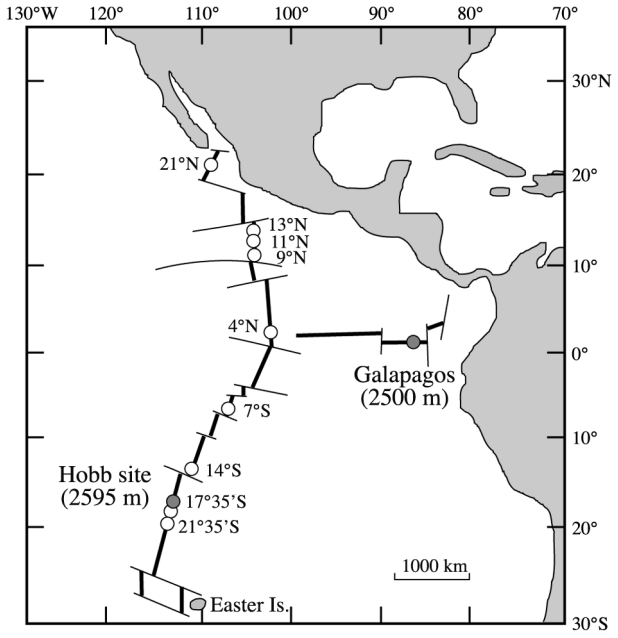


Figure 2. - Map showing the two localities (filled-in circles) of *Thermichthys hollisi*. *[Carte montrant les deux localités de capture (cercles pleins) de* Thermichthys hollisi.*]*

Table I. - Comparison of the two known specimens of *Thermichthys hollisi*. *[Comparaison des deux spécimens connus de* Thermichthys hollisi.*]*

| | SIO 88-97 HT Female | MNHN 2004-2039 Male |
|---|---|---|
| Standard length (mm) | 304 | 218 |
| Dorsal fin rays | 122 | 124 |
| Caudal fin rays | 12 | 12 |
| Anal fin rays | 88 | 88 |
| Pectoral fin rays | 37 | 36 |
| Ventral fin rays | 1 | 1 |
| Vertebrae | 20+56 | 21+55 |
| Ant. dorsal ray above vertebra no. | 11 | 10 |
| Ant. anal ray below vertebra no. | 29 | 30 |
| Ant. anal ray below dorsal ray no. | 41 | 43 |
| Long gill rakers | 3 | 3 |
| Morphometric characters in % of SL | | |
| Head length | 30.3 | 30.0 |
| Head height | - | 17.5 |
| Head width | - | 21.5 |
| Depth at anus | 13.7 | 13.5 |
| Upper jaw length | 14.3 | 13.0 |
| Eye diameter | 3.0 | 2.9 |
| Interorbital length | 10.7 | 10.0 |
| Postorbital length | - | 21.0 |
| Preanal length | 55.3 | 56.0 |
| Predorsal length | 37.8 | 33.0 |
| Pectoral fin length | 11.9 | 11.5 |
| Ventral fin length | 6.7 | 6.1 |

## Biology

Both specimens were caught associated with hydrothermal vents between 2500 and 2598 m of depth. No stomach or intestinal contents were found. The holotype is a gravid female that gave birth to larvae in the transport container on the way to the surface. Cohen *et al*. (1990) estimated that the ovaries had held about 10,000 yolk sac larvae, ca. 5 mm in length. The second specimen is an adult male judging from the well developed copulatory organ. Since the specimen was eviscerated immediately after capture the ripeness of the testes is unknown to us.

An analysis of the majority of the video documents carried out during 22 Nautile dives on the hydrothermal sites of the South East Pacific Rise at 7°24-25'S, 13°58-59'S, 17°25'S, 17°34'S, 18°36'S and 21°25-33'S (Jollivet *et al*., 2004), showed that *T. hollisi* was only observed once and the specimen was subsequently collected in the baited trap. The bait used in the trap was composed of pieces of the tubeworm *Riftia pachyptila* and the mytilid bivalve *Bathymodiolus thermophilus* collected at the preceding dives. The baited trap was moored close to small alvinellid tubeworm-covered chimneys, on an area with hydrothermal fluid diffusion (shimmering water) occupied by a *Bathymodiolus thermophilus* mussel bed. The surrounding fauna was made up of actinostolid sea-anemones (*Chondrophellia* sp.), a crab (*Cyanagraea praedator*, two specimens were collected in the same baited trap), galatheid crab (*Munidopsis* sp.), and a few ophidiiform fish (Nielsen, Møller and Segonzac, unpublished data). The *T. hollisi* was swimming close to the baited trap when it was deposited.

## Distribution

The two specimens known were caught almost 4000 km apart (Fig. 2) at depths between 2500 and 2598 m, at 0°48'N, 86°9'W and 17°35'S, 113°15'W. If *T. hollisi* is in fact an obligate vent dweller, it must be distributed along a vast linear area in the Eastern Pacific. However, during the BIOSPEEDO cruise all together 42 dives at depths of 2585-2845 m were performed on 20 vent sites and none other specimen was observed (Jollivet *et al*., 2004). Nor has it been reported from any of the many other dives at hydrothermal vents along the East Pacific Rise.

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map, to Patrice Pruvost, MNHN, Paris, for sending us the new specimen, to Michel Segonzac, Ifremer, Brest, for sending us ecological data from the locality, and to H.J. Walker, SIO, for information on the holotype.

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**Addendum**

After the manuscript was submitted one of us (JGN) has had the opportunity to study a DVD (kindly sent to us by Michel Segonzac, Ifremer, Brest), taken at a depth of about 2800 m on the South East Pacific Rise (7°-21° S, 107°-113° W). The DVD is from April 2004 taken by the French BIOSPEEDO cruise under the leadership of Dr. D. Jollivet (Roscoff, France). It shows specimens of *Thermichthys hollisi* from several localities most often in close contact with the bottom. In one sequence there are about 15 specimens in a dense school swimming hard against the strong current to keep their position over the bottom. In another sequence a specimen is eating a zoarcid fish, *Pachycara/Thermarces*, half the length of the *T. hollisi*; only the posterior half of the prey-fish has been swallowed and the anterior part is slowly moving.