Research note

New depth record of *Cherublemma emmelas*, black brotula (Ophidiiformes: Ophidiidae) from the Gulf of California, Mexico

Nuevo registro de profundidad de *Cherublemma emmelas*, brótula negra (Ophidiiformes: Ophidiidae) en el golfo de California, México

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Abstract. Seven black brotulas *Cherublemma emmelas* inhabiting deep-sea soft bottom in the southeastern Gulf of California were collected using a benthic sledge during 2 oceanographic cruises (TALUD project) at a depth range of 905 to 1 010 m, a temperature range of 4.6 to 5.2°C, and hypoxic (0.13 to 0.20 ml/l) conditions. Until now, the presence of *C. emmelas* below 750 m had not been reported in the literature. This new record extends the known depth range of occurrence approximately 260 m deeper than the previously reported limit.

Key words: *Cherublemma emmelas*, Gulf of California, new record, maximum depth, hypoxic conditions.

Resumen. En el sureste del golfo de California, se recolectaron 7 brótulas negras *Cherublemma emmelas*, que habitan los fondos blandos del talud continental. Durante 2 cruceros oceanográficos (proyecto TALUD), los organismos se capturaron con un trineo bentónico entre los 905 y 1 010 m de profundidad, registrándose temperaturas entre 4.6 a 5.2°C, y donde prevalecen condiciones hipóxicas (0.13 a 0.20 ml/l). Hasta ahora, la presencia de *C. emmelas* por debajo de los 750 m de profundidad no ha sido documentada. Este nuevo registro extiende el intervalo de distribución a aproximadamente 260 m más profundo que el límite previamente reportado.

Palabras clave: *Cherublemma emmelas*, golfo de California, nuevo record, profundidad máxima, condiciones hipóxicas.
water temperature decreases regularly from 6.2°C at the shallowest station (approximately 700 m) to 2.0°C at the deepest station (approximately 2100 m), at depths of 700-1100 m temperature range was 3.6 to 6.2°C (Hendrickx, 2003; Mendez, 2007; Zamorano et al., 2007).

Specimens were collected aboard the R/V “El Puma” of the Universidad Nacional Autónoma de Mexico. The sampling device, a 2.35 m wide, 0.90 m high epibenthic sledge equipped with a collecting net of about 5.5 cm stretched mesh size, was operated at depths of 400 to 2250 m in the Gulf of California. Every fishing operation lasted 30 min, at a ship speed of 2 knots. Sampling depth was estimated with an analogical Edo Western echo sounder. Temperature and oxygen concentrations were measured approximately 10 m above the bottom with a CTD. Specimens were fixed with a 4% formaldehyde sea water solution for at least 1 week, washed with tap water, preserved in 70% ethanol, and identified in the laboratory. The identification guide of Lea (1995) was used for identification.

A total of 6 females (TL, 100-182 mm) were caught on June 6th, 2001 (TALUD VII, St. 18, 24°15’00”N, 108°17’06”W), at a depth range of 950-1010 m. Only 1 male (TL, 210 mm) was caught on February 11th, 2007 (TALUD X, St. 14, 27°44’03”N, 111°36’49”W), at a depth of 905-943 m. The temperature range at this sampling station was 4.6 to 5.2 °C (Table 1).

The vertical distribution of dissolved oxygen concentration (Fig. 1) indicated critical hypoxic conditions (< 0.1ml/l) at depths between 300 and 800 m, but oxygen content was slightly higher in deeper localities; oxygen concentration measured close to bottom reached values of 0.13-0.20 ml/l (moderate hypoxia < 0.5ml/l) at depth approximately of 933 and 1000 m (TALUD VII St. 18 and TALUD X St. 14 respectively). In the southeastern Gulf of California, epibenthic dissolved oxygen concentration < 0.5ml/l always and occasionally < 0.1 ml/l limits the occurrence of macroinvertebrate species that cannot tolerate severe hypoxic conditions (Hendrickx 2001, 2003). However, for Cherublemma emmelas, this does not represent a barrier for dispersion from the mid-shelf into deeper waters (depth range 70 to 1000 m).

Due to their rare occurrence and the lack of earlier systematic studies of deep-sea communities off the Pacific coast of Mexico, information related to occurrence of deep-water species is uncertain and a poor definition of bathymetric distributional limits exists. This new record extends the known bathymetric range by approximately 26 atm, in an area where hypoxic (0.13 to 0.20 ml/l) conditions prevailed. The updated information on C. emmelas distribution provided in this report will help in unraveling the rich deep-sea ichthyofaunal biodiversity of Mexico, which, at this point, is poorly understood.

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**Literature cited**


**Table 1.** Sampling stations where C. emmelas were caught deeper than 900 m during the TALUD VII and X cruises in the Gulf of California. Oxygen and temperature measured at bottom level. M = male; F = female, TL= total length

<table>
<thead>
<tr>
<th>TALUD</th>
<th>Station</th>
<th>Date</th>
<th>Lat. N</th>
<th>Long. W</th>
<th>Depth range (m)</th>
<th>O₂ (ml/l)</th>
<th>Temp. (°C)</th>
<th>Material examined</th>
</tr>
</thead>
<tbody>
<tr>
<td>VII</td>
<td>18</td>
<td>7/Jun/01</td>
<td>24°15’00”</td>
<td>108°17’06”</td>
<td>950-1010</td>
<td>0.13</td>
<td>5.2</td>
<td>6 F (TL 182, 182, 181, 178, 116, 100 mm)</td>
</tr>
<tr>
<td>X</td>
<td>14</td>
<td>11/Feb/07</td>
<td>27°44’03”</td>
<td>111°36’49”</td>
<td>905-943</td>
<td>0.20</td>
<td>4.6</td>
<td>1 M (TL 210 mm)</td>
</tr>
</tbody>
</table>
Figure 1. Vertical distribution of the dissolved oxygen concentration (a-b) and temperature (c-d) measurements recorded for TALUD VII St. 18 and TALUD X St. 14 respectively.


