The finding of diamond squid *Thysanoteuthis rhombus* in the Gulf of Tehuantepec, Northeastern Tropical Pacific

El hallazgo del calamar diamante *Thysanoteuthis rhombus* en el Golfo de Tehuantepec, Pacífico tropical noreste

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**RESUMEN**

*Antecedentes.* La presencia de *Thysanoteuthis rhombus* Troschel, 1857 en el Océano Pacífico oriental se estimó en función del rango geográfico de las especies, construidas a partir de lugares de dispersión de adultos, juveniles, y masas de huevos. *Objetivos.* La presente nota describe las características morfométricas del registro más sureño del calamar *T. rhombus* en aguas mexicanas (Golfo de Tehuantepec, 16°N-95°W). *Métodos.* En enero de 2015 encontramos un ejemplar adulto femenino de 12.5 kg de peso total, 92 cm de largo total y 45.5 cm de ancho del manto. *Resultados.* Este registro tardío en el Golfo de Tehuantepec podría deberse simplemente a su relativa escasez en el Océano Pacífico oriental. *Conclusiones.* Este registro tardío en el Golfo de Tehuantepec podría deberse simplemente a su relativa escasez en el Océano Pacífico oriental. *Palabras clave:* Cephalopoda, Golfo de Tehuantepec, *Thysanoteuthis rhombus*

**NOTA**

**ABSTRACT**

*Background.* The presence of *Thysanoteuthis rhombus* Troschel, 1857 in the eastern Pacific Ocean was estimated based on the geographic range of the species constructed from scattered locations of adults, juveniles, and egg masses. *Goals.* This note describes morphometric characteristics of the southernmost registry of the diamond squid *T. rhombus* in Mexican waters of the Gulf of Tehuantepec (16°N-95°W). *Methods.* In January 2015 we found a stranded adult female weighing a total of 12.5 kg, with a total length of 92 cm, and a mantle length of 45.5 cm. *Results.* This was a mature female, with oocytes inside the oviducts that averaged 1.2 mm in diameter, and seven attached spermatophores on the buccal membrane of the female, as evidence of mating. *Conclusions.* This late registry in the Gulf of Tehuantepec could simply be due to their relative scarcity in the eastern Pacific Ocean.

**Keywords:** Cephalopoda, Gulf of Tehuantepec, *Thysanoteuthis rhombus*

The diamond squid *Thysanoteuthis rhombus* Troschel, 1857 is the single species of the family Thysanoteuthidae. It is one of the largest cephalopods, with maximum mantle lengths of both sexes of 100 cm (possibly to 130 cm), and maximum body weight of 24 to 30 kg (Roper and Jered, 2010). This squid is unique insofar as it is monogamous, living in stable couples throughout most of their life cycle (Nigmatullin *et al.*, 1995).

*Thysanoteuthis rhombus* is widely distributed in warmer waters (Guerra *et al.*, 2002), although their presence in many tropical and subtropical countries has not been completely confirmed. It is commercially fished in the Sea of Japan but is apparently very scarce in other parts of the world (Miyahara *et al.*, 2008). Findings of adults in other regions occurs when specimens are stranded or caught near the surface, most of whom are probably at the end of their life cycle (Sartor *et al.*, 2008). It is an epi-mesopelagic oceanic squid that rarely approaches the continental shelf zone, but is driven there by warm currents in the peripheral range of the species. Paralarvae and juveniles live in the epipelagic zone, while subadults and adults make daily vertical migrations in the upper 600 to 800 m depth (Nigmatullin & Arkhipkin, 1998). They lay characteristic egg masses that float on the surface of the ocean (Guerra *et al.*, 2002).

The presence of *T. rhombus* in the eastern Pacific Ocean was estimated based on the geographic range of the species constructed from scattered locations of adults, juveniles, and egg masses (Nigmatullin *et
It is an elusive species. They never appear in meso-scale detailed studies about squid (Granados-Amores, 2008). Their paralarvae could be collected from the Gulf of Tehuantepec (Alejo-Plata et al., 2013) or the Gulf of California (De Silva et al., 2015). A single registry was reported from the Gulf of California (Hendrickx et al., 2007). In the Baja California Peninsula, *T. rhombus* has been recorded only from stomach contents of their predators (Galván-Magaña et al., 2013). This species appears to replace large jumbo squid (*Dosidicus gigas* (d’Orbigny, 1835)) in the swordfish diet when the latter are absent, and few records exist from the California Current (Markaida & Hochberg, 2005). The aim of this note is to register the southernmost record for *T. rhombus* in México.

A female (45.5 cm mantle length, ML) was found dying and stranded on Punta Chivo, a rocky promontory located about 20 m away from the coast opposite Bahía Guelaguichi in the Gulf of Tehuantepec (16.103° N, 95.278 W) on 20 January 2015. The morphological characters fully agreed with the diagnostic features of the species (Roper & Jereb, 2010). Meristic data, sex, and maturity stage were recorded (Table 1). Because the mantle was damaged, only head, arms, and the gladius were preserved in 70% ethanol in the cephalopod collection at the Universidad del Mar, Puerto Ángel, Oaxaca, Mexico (reference number MHNUMAR-CEPHA 5101).

We reported a mature female (Table 1), with oocytes inside the oviducts that averaged 1.2 mm in diameter. We found 7 attached spermatophores on the buccal membrane of the female, as evidence of mating. The complex morpho-ecological adaptations of *T. rhombus* are reflected in the distinctive features of the reproductive system (Nigmatullin et al., 1991). We observed very large oviducal glands, small oviducts in
The Gulf of Tehuantepec is characterized by its continental shelf, which widens to the east, reaching a maximum width of 106.8 km at 95.5° W. There are two main climatic seasons: one is dry (November to April), and the other is rainy (May to October). High seasonal productivity and low sea-surface water temperature are due to strong vertical mixing and entrainment associated with mountain gap winds (Trasvina & Barton, 1995), mainly from November to April. The unusual stranding of *T. rhombus* may be related to this upwelling. This squid is an epipelagic to mesopelagic species that inhabits open ocean water, rarely approaching the coast, has a passive migration, and is regulated by oceanographic conditions (Miyahara et al., 2008). This late record in the Gulf of Tehuantepec could simply be due to their relative scarcity in the eastern Pacific Ocean.

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**REFERENCES**


