**T he first record of Hippocampus denise (Syngnathidae) from Australia**

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**Abstract**

A specimen of Hippocampus denise (Syngnathidae) recently collected from the outer Great Barrier Reef, Queensland, constitutes the first record of this species from Australian waters. Counts and proportional measurements confirm the identity of the specimen. It was taken by ROV at a depth greater than previously reported for the species and from a new host species of octocoral. We postulate that one reason for the species having previously evaded detection in the region is due to the paucity of knowledge of Australian mesophotic reef systems and briefly discuss the implications of this on assessing the species’ conservation status.

**Zusammenfassung**

Kürzlich konnte ein Exemplar von Hippocampus denise (Syngnathidae) im äußeren Bereich des Großen Barrierreiffs, Queensland, gefangen werden; damit ist der Erstnachweis dieser Art in australischen Gewässern gelungen. Nach Kennzahlen und proportionalen Messungen konnte die Art eindeutig bestimmt werden. Das Exemplar war durch ein ferngesteuertes Fahrzeug (ROV) in einer größeren Tiefe gesammelt worden als nach bisherigen Berichten und über einer neuen Wirtsart der Octokorallen. Ein Grund für den bisher fehlenden Nachweis dort sind unserer Auffassung nach die geringen Kenntnisse über die mesophotischen australischen Riffsysteme; die Folgerungen im Blick auf den Schutzstatus der Art werden kurz diskutiert.

**Résumé**

Un spécimen d’Hippocampus denise (Syngnathidae) récemment collecté au large de la Grande Barrière de Corail, Queensland, constitue la première mention de cette espèce pour les eaux australiennes. Les données méristiques et morphométriques confirment l’identité de l’espèce. Elle a été capturée par ROV à une profondeur plus importante que signalée jusqu’ici et sur une nouvelle espèce-hôte d’octocoral. Nous postulons que la raison qui explique que cette espèce a échappé à toute détection dans la région est due à la connaissance trop partielle des récifs mésophotiques australiens et nous en abordons brièvement les conséquences pour ce qui concerne le statut de la conservation de l’espèce.

**INTRODUCTION**

One of the smallest known species of seahorse, Hippocampus denise Lourie & Randall, 2003, has not been recorded from Australia despite its very widespread occurrence in adjacent regions of the Indo-West Pacific that make up the “Coral Triangle”. This gorgonian octocoral-dwelling species is recorded to range from Malaysia and throughout Indonesia to Palau, Micronesia and south-east to the Solomon Islands and Vanuatu (Lourie & Randall 2003). Lourie & Kuiter (2008) also report it from New Ireland Province, Papua New Guinea (PNG) and photographs published on the web indicate that it also occurs in West New Britain and Milne Bay Provinces, PNG (Banks 2006 –
reported as H. bargibanti Whitley). We report the first finding of Hippocampus denise in Australian waters, from a single specimen on an octocoral collected by a remotely operated vehicle (ROV) used in a study of mesophotic (30-150 m depth) coral communities off the North Queensland coast (Bongaerts et al. 2011). It is deposited in the South Australian Museum, Adelaide (SAM A).

MATERIAL AND METHODS

MATERIAL EXAMINED – Hippocampus denise, SAM A F13806, 13.7 mm SL, approximately 240 km ENE Cairns, Qld, NW corner of Holmes Reef East, 16°.421’ S, 147°.987’ E, 25 October 2010, on Villogoria sp. taken by ROV from a depth of ~100 metres, collected by Tom Bridge and Dave Whillas (AUV Coral Sea Exploratory Expedition); fixed and preserved in 70% ethanol.

To verify the specimen’s identity, counts and measurements were taken following Lourie & Randall (2003). Counts of trunk rings (TrR), tail rings (TaR) and pectoral, dorsal and anal fin rays (PF, DF and AF, respectively) were made using a microscope and from a microtomograph (CT scan) of the specimen as per Foster & Gomon (2010). Measurements to the nearest 0.1 mm were made using a microscope with an eyepiece graticule and from an enlarged photograph incorporating a scale bar. Measurements were made of head length (HL), trunk length (TrL), tail length (TaL), snout length (SnL), orbital diameter (OD), post orbital length (PO), crown height (CH) trunk depth at TrR 9 (TD9), dorsal fin base length (DL). Standard length (SL) = HL + TrL + TaL.

RESULTS AND DISCUSSION

Description - Colour in life, dark reddish-orange with faint banding on the tail; sex uncertain but body proportions and comparison of the CT scan with X-rays of sexed individuals (Lourie & Randall 2003) suggest it is a non-breeding male.

Counts – TrR 12; TaR 29; PF 11; DF 14; AF 4. Principal measurements (mm) – HL 2.2; TrL 3.6; TaL 7.9. Proportional measurements (as percentages of SL, HL or SnL, as indicated, with range from 14 specimens of Hippocampus denise examined by Lourie & Kuiter (2008) shown in parentheses) – HL 16.1% in SL (16.0-23.1); HD 53.6% in HL (41.1-55.7); SnL 37.2% in HL (27.1-38.7); SnD 76.4% in SnL (62.7-81.2); OD 23.5% in HL (18.8-23.5); PO 40.8% in HL (39.1-45.2); CH 45.4% in HL (35.2-51.6); TrL 26.3% in SL (23.1-31.7); TaL 57.7% in SL (47.4-57.2); TD9 10.2% in SL (4.1-15.5); DL 10.2% in SL (6.4-10.1).

In appearance the specimen SAM A F13806 closely resembles the description and published photographs of Hippocampus denise (Lourie & Randall 2003). All counts and proportional measurements are consistent with those reported for the species by Lourie & Randall (2003) and Lourie & Kuiter (2008) with the departures of TaL and DL from the cited ranges statistically insignificant. A similar species, H. bargibanti, is known to occur on the Great Barrier Reef (GBR) (Paxton et al. 2006) but significant proportional measurements (Lourie & Randall 2003: Table I) along with tail lengths of 14.4-16.5 mm SL.
ring count, a non-bulbous snout and an absence of tubercles above the eyes specifically exclude this species.

As well as being the first Australian record of Hippocampus denise, the specimen, SAM A F13806, is notable for the depth at which it was found (100 m) - the deepest yet reported for the species - and for the host species, Villogorgia sp. Previously reported hosts are Annella, Muricella and Echinogorgia, at depths ranging from 13-90 m (Lourie & Randall 2003). Gorgonian octocorals occur on mesophotic reefs throughout northern Australian seas, including a vast area of the GBR outer shelf to 150 m depth (Bridge et al. 2011). That H. denise has previously been recorded seems surprising and suggests that it may be rare in Australian waters. However, this species of pygmy seahorse, along with others that may occur in the region, is so small and cryptic that it is extremely difficult to find, the difficulty compounded by its distribution well into the mesophotic zone beyond the range of scuba divers. Mesophotic communities in Australia have received little attention compared to their shallow-water counterparts due to their relative inaccessibility and only recently have technological advances, such as the use of ROVs, opened up the zone for exploration. Well-known Coral Triangle octocoral species have also recently been found for the first time in Australian waters during surveys of the GBR outer shelf (Bridge, unpublished data) and it is probable that more species of pygmy seahorses occur in northern Australian waters but no focused searches have yet been made. Unfortunately, research is hampered in Australia by restrictive scientific diving regulations on, for example, the use of rebreather units which are being used elsewhere to survey the mesophotic zone (e.g. Pyle et al. 2008).

Pygmy seahorses are tiny, few more so than H. denise, and are likely to be missed unless specifically searched for in suitable communities. Hippocampus denise is listed as “Data Deficient” on the IUCN Red List of Threatened Species (Project Seahorse 2003) and the conservation action calls for further research on the species biology, ecology, habitat, abundance, and distribution. Targeted surveys are necessary to gather this information before an assessment of the conservation status of the species in Australia can be made.

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