

New record of the nudibranch *Polycera hedgpethi* Er. Marcus, 1964, in South Australia, with a discussion on its occurrence in Australia

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Polycera hedgpethi was first described from California (Marcus 1964), where it occurs along the entire Californian coastline (Gosliner 1982). Some authors (Gosliner 1982; McDonald 1983) believe it to also occur in the Gulf of California as *P. gnupa* Ev. Marcus and Er. Marcus, 1967, but this remains contested (Miller 2001). After its description, *P. hedgpethi* was quickly recorded from a number of other localities across the globe, often appearing in ports. Its widespread distribution has been interpreted as indicating an invasive species, thought to have spread via fouling on ships (Rudman 1999). This scenario was already suggested for *Thecacera pennigera* by Willan (1976). To date, the Australian National Marine Pest Information System (NIMPIS) suggests that *P. hedgpethi* is native to California, cryptogenic in the Caribbean, and introduced to South Africa, south West Africa, the Mediterranean, Australia and New Zealand (NIMPIS 2002 and references therein). It is also recently reported from Japan (Keiu 2000) and the Atlantic coast of the Iberian Peninsula (Caballer and Ortea 2002). Although California is assumed to be the natural range of *P. hedgpethi*, multiple specimens were known from New Zealand prior to the original species description (Miller 2001).

Polycera hedgpethi in South Australia

The observations presented in this paper confirm the presence of *Polycera hedgpethi* in South Australia. Until now, *P. hedgpethi* was only known from a single, unpublished specimen collected from North Haven boat ramp, Port Adelaide, in 1998 (SAM D12298). In May 2004, a photograph of a specimen was sent to the South Australian Museum from D. Hutson. Mr Hutson confirmed that a population was established at North Haven, and collected a further 5 specimens in July 2004 from the same area (SAM D12299) (Figure 1A). In the same month, Mr Hutson observed many additional specimens on the wreck of the New Endeavour, also located in the Port River. Adults, and occasionally egg masses and juveniles, were present at the North Haven boat ramp during observations from May through to

August 2004, and were not seen again until the water temperature dropped in June 2005 (weekly observations by D. Hutson).

This concurs with a suggestion that *Polycera hedgpethi* is found more commonly in winter months (Rudman 1999), although records show it can occur in warmer months as well (Poddubetskaia 2003; Harasti 2004; pers. obs. Melbourne).

Surprisingly to date, there is no information about larval stages and thus potential natural dispersal of this species. Gosliner (1982) briefly mentions white egg ribbons found alongside specimens in South Africa. One individual collected from North Haven also laid an upright, slightly outward-sloping, white spiralled egg mass in the laboratory (Figure 1B,C). Measurements by the author on uncleaved eggs determined that each cell had a mean diameter of $69 \pm 4 \mu\text{m}$ ($n=20$). According to comparisons of egg size and developmental strategies (Thompson 1967; Hadfield and Switzer-Dunlap 1984; Rose 1985), this size is congruent with a planktotrophic strategy. Clearly *P. hedgpethi* possesses swimming larvae, capable of long-distance dispersal.

Polycera hedgpethi in Australia

New South Wales

Polycera hedgpethi was first recorded in Australia in Mallacoota, in northern Victoria, in 1973. A photograph was taken by N. Coleman, and later identified by R. Burn (R. Willan, pers. comm.). It was then identified in Port Hacking, NSW, in 1979 (Coleman 2001). Recent targeted marine pest surveys in port locations in New South Wales (Port Kembla, Botany Bay, Eden) (Pollard and Pethebridge 2002a; 2002b; Pollard and Rankin 2003) did not detect any *P. hedgpethi*. Another survey in the Port of Sydney also did not detect that species (AMBS 2002). However, databased records from the Australian Museum (AM) show specimens were collected in the early 1980's from Botany Bay, Sydney Harbour and Ulladulla. There is also a recent AM record for

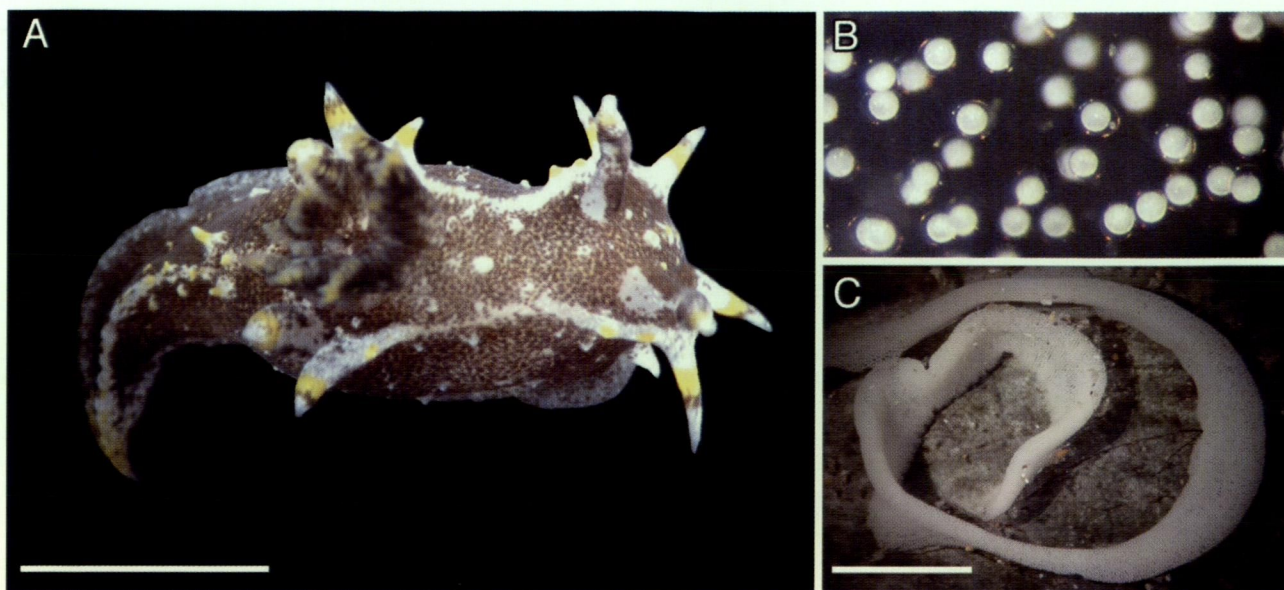


Figure 1 A, *Polycera hedgpethi* (SAM D1299). B, Light micrograph of uncleaved eggs. C, Egg mass. Scale bar = 10 mm.

Sydney Harbour in 1999, and additional recent records exist on the Sea Slug Forum for both Sydney Harbour (Rudman 1999) and southern NSW (Harasti 2004).

Victoria

Similar port surveys have targeted introduced species in Victoria (Hastings, Portland, Geelong, Melbourne, Western Port) (Currie and Crookes 1997; Parry *et al.* 1997; Currie *et al.* 1998; Cohen *et al.* 2001; Parry and Cohen 2001) but these did not detect any specimens of *Polycera hedgpethi*. Numerous specimens have been found in the Port of Melbourne, Port Phillip Bay, Victoria, since that survey was carried out, with the majority of observations occurring at Altona pier (E. Bone, pers. comm.). A post-survey record also occurs at Cunningham pier, Corio Bay, Geelong (SAM D19297). Hewitt *et al.* (2004) list *P. hedgpethi* as present in Port Phillip Bay, but incorrectly cite Burn (1989) as the source of the observation; the species is not mentioned in this account.

Other locations

An additional 29 surveyed ports in WA, SA, TAS, QLD and NT listed in the National Port Survey database (C. Sliwa pers. comm.) did not detect *Polycera hedgpethi*. These included the major ports of Fremantle, Adelaide, Hobart, Brisbane and Darwin, and a range of regional ports throughout. The results for Karumba (Neil *et al.* 2001), Darwin (Russell and Hewitt 2000) and Gove (Neil *et al.* 2003) are published, but many are still pending public release. The majority of these surveys were carried out using the Australian Ballast Water Management Advisory Council (ABWMAC) recommendations on target species, which list *P.*

hedgpethi as a known exotic in its Schedule of Introduced Species (Schedule 3) (Russell and Hewitt 2000).

Although the pest surveys listed above did not discover any specimens of *Polycera hedgpethi*, a specimen was collected from Moreton Bay, Brisbane by T. Gosliner and R. Willan in 1998 (R. Willan, pers. comm.). Also, a single record of *P. hedgpethi* exists from a pier in Albany, southern Western Australia (Wells and Bryce 1993), but no further specimens have since been found in that particular locality, or the entire state (C. Whisson and C. Bryce, pers. comm.). It appears that while marine surveys in port localities are an important and useful tool for detecting some faunal components, they often do not retrieve seasonally common, shallow water, pylon-dwelling, conspicuous nudibranchs. This may be attributed to surveys being carried out in months when seasonal taxa are not present. In this case, *P. hedgpethi* may be anecdotally less likely to be present in warmer months, when approximately two thirds of the surveys examined here were carried out. It seems likely that *P. hedgpethi* is common in certain localities in NSW and Victoria, but less is known about its occurrence in other parts of Australia.

In summary, *Polycera hedgpethi* was first discovered in Australia in north-eastern Victoria, only nine years after its description from its assumed natural range in California. Six years later, it was recorded in southern NSW and quickly thereafter in central NSW and southern Western Australia. In the late 1990's, specimens were discovered in the Ports of Melbourne and Adelaide. Gosliner (1987) also suggested that *P. hedgpethi* may occur naturally in South Africa. Given the length of time that international shipping occurred

prior to the description of *P. hedgpethi*, its natural distribution remains obscure.

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