ON THE NOMENCLATURE OF THE COMMERCIALLY IMPORTANT SPINY LOBSTERS *PANULIRUS LONGIPES FEMORISTRIGA* (VON MARTENS, 1872), *P. BISPINOSUS* BORRADAILE, 1899, AND *P. ALBIFLAGELLUM* CHAN & CHU, 1996 (DECAPODA, PALINURIDAE)

BY

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Until 1996, two subspecies of the commercially important Indo-West Pacific spiny lobster *Panulirus longipes* (A. Milne-Edwards, 1868) were recognized. They are the western spotted-legged form, *Panulirus longipes longipes* (A. Milne-Edwards, 1868) (type locality: Zanzibar) and the eastern striped-legged form, *P. longipes femoristriga* (Von Martens, 1872) (type locality: Amboina, Indonesia) (Holthuis, 1991). Chan & Chu (1996) discussed the taxonomy of *P. longipes* and described a new species, *P. albiflagellum* (type locality: Taiwan) which they believed had previously been misidentified as *P. longipes femoristriga*. Chan & Chu (1996: 377) also argued that *P. bispinosus* Borradaile, 1899 (type locality: Loyalty Islands) was probably a junior subjective synonym of *P. longipes femoristriga* (Von Martens, 1872). Holthuis (1991) had noted that the holotype of *Palinurus femoristriga* was deposited in the Museum für Naturkunde in Berlin (ZMB, catalogue number 1333), but the then curator of Crustacea of that museum, H.-E. Gruner, had informed him that this specimen could not be located and was probably lost.

Chan & Chu (1996) showed that what had commonly been called *P. longipes femoristriga* was actually composed of two superficially similar taxa that could be separated by three very distinct morphological characters as well as very different colouration on three parts of the body (also see Chan, 1998), the most obvious being the colour pattern of the antennular flagella. One taxon has the median area of the anterior carapace behind the frontal horns usually bearing a longitudinal row of three spines, the ventral surfaces of the two distal antennal segments each with two large spines, the thoracic sternum has two strong submedian protrusions, the antennules have the outer flagellum dark brown and the inner flagellum entirely

whitish, the antennal peduncle (including the stridulating pad) is pinkish in life, and the lateral carapace has two complete, longitudinal white stripes extending along the entire length (here referred to as the "white whisker form"). The other taxon has the median area of the anterior carapace behind the frontal horns always bearing some smaller irregular spines in addition to the regular row of three spines, the ventral surfaces of the two distal antennal segments each with one large spine which sometimes has additional, scattered spinules, the thoracic sternum lacks any strong submedian protrusion, both the outer and inner antennular flagella have alternating dark brown and white bands, the antennal peduncle is brown to purple with the stridulating pad bright blue in life, and the lateral carapace has one short (upper) and one long (lower) longitudinal white stripe (here referred to as the "banded whisker form"). None of these characters, however, could be discerned from the original description of *Palinurus femoristriga* by Von Martens (1872: 125), and Chan & Chu (1996) were uncertain which of the two taxa they recognized was actually conspecific with the type of *P. longipes femoristriga*. Since the type of *P. longipes femoristriga* was apparently lost at the time of their study, Chan & Chu (1996: 377) selected the only topotypic specimen (Nationaal Natuurhistorisch Museum, Leiden, ex Rijksmuseum van Natuurlijke Historie, RMNH D1430) they had from Amboina, which they felt corresponded with what they understood as *P. longipes femoristriga* s. str., as the neotype for the taxon. This same specimen had earlier been described in detail by George & Holthuis (1965) who provided descriptions of the colour pattern on its legs. The colours on this specimen, however, are now too much faded to be useful (Chan & Chu, 1996: 377). With the identity of the "banded whisker form" fixed, Chan & Chu (1996) subsequently described the "white whisker form" as a new species, *P. albiflagellum*, using a specimen from Taiwan as the holotype (now deposited in the National Taiwan Ocean University, Keelung (NTOU), catalogue number H-1984-9-14).

In 1997, Ray W. George commented to us (pers. comm.) that in 1976, H.-E. Gruner had made some colour notes of the holotype of *Palinurus femoristriga* Von Martens, 1872, at his request, before it was supposedly lost. These notes showed that the holotype had an unbanded pale inner antennular flagellum (the "white whisker form") and was almost certainly conspecific with *P. albiflagellum* Chan & Chu, 1996. George (1997: 1122) subsequently commented that because of this, *P. albiflagellum* "... becomes a synonym of *P. femoristriga*". Through the courtesy of Oliver Coleman, the current curator of Crustacea at ZMB, a fresh search was made for the holotype of *Palinurus femoristriga* (Von Martens, 1872). This time, however, the holotype was found, and was sent to the authors for study. The holotype of *Palinurus femoristriga* (Von Martens, 1872) (female 55.0 mm carapace length, with a label of location Amboina and obtained by

C. B. H. von Rosenberg, colour somewhat faded but still with the two long longitudinal stripes along the lateral part of the carapace visible) agrees very well with that of *P. albiflagellum* Chan & Chu, 1996. There are also no major morphological differences between them. The two specimens are clearly conspecific, as indicated by George (1997). The correct name for the species with the white inner antennular flagellum ("white whisker form") should thus be *P. femoristriga* (Von Martens, 1872). With the rediscovery of the holotype of *Palinurus femoristriga*, the neotype designated by Chan & Chu (1996), which corresponds to the "banded whisker form", is no longer valid (Article 75.8, International Code of Zoological Nomenclature, 1999).

So what is the valid name of the taxon with striped legs and banded antennular flagella ("banded whisker form"), which Chan & Chu (1996) had incorrectly called "*P. longipes femoristriga*"? Chan & Chu (1996) examined the holotype of *P. bispinosus* Borradaile, 1899 (type locality: Loyalty Islands, deposited in the University Museum of Zoology, Cambridge, U.K.) and noted that it was a small specimen measuring only 8.1 mm in carapace length. Nevertheless, they observed that although it was a juvenile (with the abdominal furrows medially interrupted and posterior fork of the thoracic sternum not developed) and badly damaged (body slightly squashed, resulting in the abdomen and thoracic sternum being slightly carinate), "... it has five spinules on the anteromedian carapace between the supraorbital horns and 2nd anterior teeth, and the antennal peduncle bears only one large spine on the ventral surface of each of the distal two segments" (Chan & Chu, 1996: 377). No colour characteristics were clearly discernible on this specimen, except that many parts of the body have turned black (in all probability the specimen had completely dried up before at least once). Considering that the specimen was collected from the western Pacific, and has the morphological characteristics of the "banded whisker form", it is almost certainly conspecific with the striped-legged species Chan & Chu (1996) had called "*P. longipes femoristriga*". Since the name *P. femoristriga* should now apply to the "white whisker form", the next available name for the "banded whisker form" should thus be *P. longipes bispinosus* Borradaile, 1899. We are confident this decision is the correct one as only the "banded whisker form" (here regarded as *P. longipes bispinosus*) is known from the Loyalty Islands thus far, with the "white whisker form" (*P. femoristriga*) yet to be seen there (Gustav Paulay, pers. comm.).

George (1997: 1122), quoting a 1976 letter he had from Dr. C. B. Goodhart, the then curator of the Zoology Museum of Cambridge University, who examined the type specimen of *P. bispinosus* on his behalf, noted the following: "Although a bit faded, I could definitely say that one ramus was white and the other brown on the antennule, rather than being banded". On the basis of this observation alone, George (1997: 1122) synonymized *P. bispinosus* Borradaile, 1899, with

P. femoristriga (Von Martens, 1872) and *P. albiflagellum* Chan & Chu, 1996, and believed that the taxon with striped-legs and banded antennular flagella (i.e., Chan & Chu's "*P. longipes femoristriga*") was still unnamed. We disagree. The colour of the flagellum reported by George (1997) is clearly the result of fading as well as of poor preservation, and is unlikely to be natural. In any case, the armatures of the anteromedian part of the carapace and of the two distal segments of the antennular peduncle of *P. bispinosus* clearly argue against its synonymy with *P. albiflagellum*, which is now a synonym of *P. femoristriga*. Moreover, as stated above, only the "banded whisker form" (*P. longipes bispinosus*) is known from the Loyalty Islands thus far.

In summary, the correct names for the two subspecies of the Indo-West Pacific spiny lobster *Panulirus longipes* (A. Milne-Edwards, 1868) should be *P. longipes longipes* (A. Milne-Edwards, 1868) (Indian Ocean, with spotted legs) and *P. longipes bispinosus* Borradaile, 1899 (Pacific, with striped legs). Both species have both their antennular flagella banded. The name for the species with the white inner antennular flagellum should be *P. femoristriga* (Von Martens, 1872), with *P. albiflagellum* Chan & Chu, 1996, as its junior subjective synonym.

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