Rediscovery of *Anthias salmopunctatus* Lubbock & Edwards, 1981, with comments on its natural history and conservation

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After c. 30 years without sighting or capture, *Anthias salmopunctatus* was rediscovered at the type locality, St Peter and St Paul’s Rocks, Mid-Atlantic Ridge. To date, the known distribution is restricted to depths varying from 35 to 55 m in vertical drop offs around the perimeter of the islands (c. 400 m). This may be the smallest geographic range known for a marine fish species.

Key words: deep reefs; endemic species; Mid-Atlantic Ridge; restricted range; St Paul’s Rocks.

The fairy basslet *Anthias salmopunctatus* Lubbock & Edwards, 1981, was described from four individuals captured on deep (30–35 m) rocky drop offs off St Peter and St Paul’s Rocks (Lubbock & Edwards, 1981), a tiny isolated group of islets on the Mid-Atlantic Ridge (00°55’ N; 29°21 W; Feitoza et al., 2003). At the time, the generic status of this fish was uncertain and the species was included within *Anthias* on a provisional basis. In fact, the species belongs to a new anthiine genus currently under study (P. C. Heemstra & W. D. Anderson Jr, pers. comm.). After the collection of the type series in September 1979, the species remained unrecorded during modern expeditions to the type locality (Feitoza et al., 2003; Vaske et al., 2005). This fairy basslet was recently observed and photographed in situ during an early-2006 expedition. An account of the general habits and habitat of *A. salmopunctatus*, and comments on population risks and conservation status of this St Paul’s endemic are presented here.

*Anthias salmopunctatus* was observed between 35 and 55 m and was most abundant between 40 and 45 m on almost-vertical rock drop offs (Fig. 1). This fish aggregates in small groups of five to 10 individuals swimming close to crevices into which they hide when threatened [Fig. 2(a)]. Several such groups were observed, each group taking refuge in its own crevice when approached
by a diver. There appeared to be no exchange of individuals between groups or crevices, suggesting that appropriate shelter is one of the factors limiting the distribution of this species. Individuals of *A. salmopunctatus* were observed to leave a shelter only when a school of juvenile *Chromis multilineata* (Guichenot, 1853) approached the cliffs. Both species are quite similar in shape and, at depth with available light, are of almost identical colouration: faded-brown [Fig. 2(b)]. Presumably, *A. salmopunctatus* get protective advantages of schooling with a similar species in larger, multispecific groups while foraging on open-water plankton. Such behaviour may be regarded as school-oriented mimicry or social mimicry as described by Dafni & Diamant (1984) and by Randall & McCosker (1993). There are several facets to social mimicry and a species may enter a school or shoal both for increased security during foraging and to evade potential predators (Krajewski et al., 2004). This latter is not the case of *A. salmopunctatus* because experimentally frightened individuals moved back to the rocky crevices while *C. multilineata* stayed in open waters. If the mimicry hypothesis between *A. salmopunctatus* and *C. multilineata* holds true, it would add to a series of examples of mimicry in marine fishes (Randall, 2005).

Due to the dimension of the archipelago, all species endemic to St Peter and St Paul’s Rocks have an extremely limited geographic distribution. The area above the 50 m isobath for the whole archipelago is said to be $<0.5$ km$^2$ (Lubbock & Edwards, 1981; Feitoza et al., 2003). Most species listed as endangered or vulnerable (IUCN, 2004; Ministério do Meio Ambiente, 2004a) are so considered because the available space for them is very limited (Hawkins et al., 2000). Within the available space, all individuals of *A. salmopunctatus* were recorded in depths between 33 and 55 m along a 400 m stretch of vertical cliffs on the western side of the rocks. Very little of the potential distributional area has been explored but, unless depth range is greater than currently known, *A. salmopunctatus* may have one of the most restricted geographic distributions recorded for a marine fish species. Its range may even be smaller than that of the other St Peter and St Paul’s endemics. The crypto-benthic *Enneanectes smithi* Lubbock & Edwards, 1981, and the ubiquitous *Stegastes sanctipauli*
Lubbock & Edwards, 1981, are commonly found from the surface to depths of at least 55 m all around the rocks, and Prognathodes obliquus Lubbock & Edwards, 1980, is found below 40 to, at least, 100 m. Apparently, neither A. salmopunctatus nor other endemic fishes may be under great risk of extinction, as their habitat is not directly affected by human activities, but such extreme restricted geographic distribution is sufficient to consider a species threatened as they could be vulnerable to natural impacts (Hawkins et al., 2000). Gasparini et al. (2005) listed P. obliquus as one of the target species for the ornamental trade but capture for this purpose has recently been banned on Brazilian oceanic islands (Ministério do Meio Ambiente, 2004b), and there is no evidence that any of the endemic species is presently targeted by that fishery. It could be argued that the effects of heavily subsidized professional fishing for large pelagic species (Oliveira et al., 1997; Vaske et al., 2005), combined with the continuous disrupting human occupation of the islets may have unsuspected effects on the structure and stability of the rocks’ biota. Contrarily to E. smithi and S. sanctipauli, A. salmopunctatus and P. obliquus shows low densities and seem to have low absolute numbers (unpubl. data). The latter may be

Fig. 2. (a) A small group of Anthias salmopunctatus on the cliff of St Peter and St Paul’s Rocks. The crevice in which they hide is on the right. (b) A mixed group of A. salmopunctatus and Chromis multilineata. The flash of the photographic camera allows distinction of colours that appear, under subdued natural light, similarly dull brown.
a bias due to the fact that only the shallow portion of the depth range is being sampled or, alternatively, the species really have low population densities. A precise evaluation of the risks of extinction urgently requires extensive work to better estimate the distribution and population size of *A. salmopunctatus* and other fishes endemics to St Peter and St Paul’s Rocks.

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