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The first record of the littoral skink *Emoia atrocostata* preying on a marine fish, the pearlyspot blenny *Praealticus margaritarius*

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The littoral skink *Emoia atrocostata* is widely distributed in the Indo-Australian Archipelago and Pacific islands, including the Miyako Islands Group of the Ryukyu Archipelago, Japan (Richmond et al., 2021). In a recent phylogenetic study, Richmond et al. (2021) recognised four genetically distinctive lineages within *E. atrocostata*, which were paraphyletic as a whole against a few closely related species. The population of the Miyako Islands belongs to the north-western Pacific lineage along with those in Taiwan, the Philippines and Yap Island. This skink mainly inhabits rocky shores or mangrove forests and is found in the intertidal zone during low tide (Alcala & Brown, 1967; Huang, 2011; Asato et al., in press). Knowledge regarding their diet is very limited, and only a few insects (Afrophoridae and Formicidae) and crabs were hitherto reported as stomach contents of the Taiwan population (Huang, 2011).

On 8 October 2022, during a field survey of the population status of *E. atrocostata* on the southern coast of Miyakojima Island (24° 43'27.06" N, 125° 21'30.60" E), we had an opportunity to obtain evidence of this skink predating a blenny. It was sunny and the air temperature was about 29 ˚C. The coastal area where we conducted the survey consisted of outcrops of bare limestone and a few small estuaries covered with coral gravel with many tidal pools at low tide. In this area, we regularly observe active *E. atrocostata* on limestone rocks and boulders in the upper tidal zone as well as those in intertidal zone at the low tide. At 10:30 h, we caught an individual *E. atrocostata* by hand while it was basking on a boulder in the intertidal zone of an estuary. At that time, the tide was ebbing and several tide pools had already appeared, and the distance from the skink to the nearest tidal pool was approximately 10 metres. Immediately after capture, the skink regurgitated a blenny into the observer's hand. The skink was an adult male and the measurements were as follows: snout-vent length 75 mm, body weight 6.83 g, and maximum head width 10.0 mm, gape length (length from snout to mouth corner) 11.2 mm, gape width (distance between mouth corners on both sides) 9.2 mm (Fig. 1A). After measurements, the skink was released at the capture point. The prey blenny was fresh and intact without any injuries and was identified as a pearlyspot blenny *Praealticus margaritarius* based on the presence of a palm-like supraorbital tentacle, and small white spots scattered on the body (Nakabo, 2000). Later,

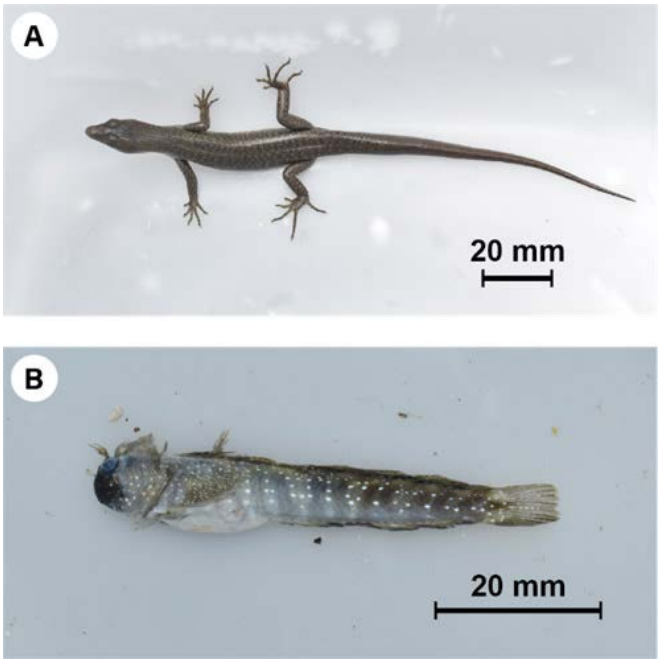

Figure 1. Predator skink and prey blenny - **A.** *Emoia atrocostata* (predator), and **B.** *Praealticus margaritarius* (prey)

this identification was confirmed by the DNA barcoding using a partial sequence of the mitochondrial 12S ribosomal RNA gene (168 bp). The prey was measured to have a total length of 57 mm (a standard body length of 51 mm), a maximum body width of 8.9 mm, and a body weight of 1.28 g (Fig. 1B). The skink regurgitated the blenny tail first. These circumstances suggest that the skink had caught the blenny when it was alive and had swallowed it head first.

The pearlyspot blenny is distributed in the north-west Pacific including Taiwan and Japan (Lee, 1980; Motomura, 2020) and lives mostly in the intertidal zone with where it displays amphibious behaviour (Ord & Cooke, 2016; Egan et al., 2021). Particularly, the blennies of the Ryukyu populations frequently foray out of the water to move between adjacent pools or into open water (Ord & Cooke, 2016). The species is quite common on the rocky coast of Miyakojima Island, and we found a number of blennies hopping on the wet surface of limestone outcrops. During low tide, there is a large overlap in the habitat use between

E. atrocostata and *P. margaritariusso* that they may easily encounter each other. Consequently, blennies are potentially not uncommon in the diet of *E. atrocostata*. Previously recorded cases of lizards as predators of fish are restricted to monitors (Varanidae) and the fish have generally been of freshwater species (e.g. Shine, 1986; Cota & Sommerlad, 2013; Karunarathna et al., 2017). Although several small-sized lizard species that inhabit coastal environments are known to prey upon marine invertebrates (e.g. Hazard et al., 1998; Janssen et al., 2015), predation of marine fish is quite rare. The pearlyspot blenny is a large-sized prey for *E. atrocostata* (over 18% of the skink's body weight in the present case) compared to other prey reported so far. If the predation on this species is common for *E. atrocostata* then it could account for a large proportion of the skink's nutritional intake.

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