Cleaner shrimp cooperate with client fishes in a cleaning symbiosis to remove clients’ ectoparasites (McCammon et al. 2010) and to assist in wound management (Vaughan et al. 2018). These interspecific interactions are generally mutually beneficial. In the recent laboratory study by Vaughan et al. (2018), cleaner shrimp *Lysmata amboinensis* (de Man, 1888) were shown to reduce inflammation associated with client fish injury. The cleaning of wounds of terrestrial clients by birds is common (Sazima 2011), but rarely have there been observations of wound cleaning in marine organisms (see Foster 1985; Vaughan et al. 2018).

Here, we report the observations of a wounded saddleback clownfish, *Amphiprion polymnus* (Linnaeus, 1758), seen three times per week over a three-month period being cleaned by up to five individual *Ancylomenes* sp. shrimp (Fig. 1A, B). The fish was first observed with a lesion which distended the eye and then became an open wound. It was living with two smaller conspecifics and the shrimp on a *Stichodactyla haddoni* (Saville-Kent, 1893) anemone at 2 m depth in open sand off Lissenung Island, Kavieng, Papua New Guinea. It and one of the conspecifics also had several blemishes on their bodies, and the cause of these blemishes and the lesion was unknown.

Initially, the fish remained still during cleaning but later shook off the cleaning shrimp in a response to cleaners known as jolting (see explanation in Vaughan et al. 2018). Shortly thereafter, the shrimp would return and clean again. The shrimps picked at the wound with their chelae. The lesion size was much diminished after three months (Fig. 1C), and the clownfish’s wound appeared to heal over the course of the observations. After three months of thrice-weekly follow-up dives to check the progress of the wound healing, on 24 July 2010, the fish had disappeared. The clownfish’s jolting is a behaviour also observed during wound cleaning by birds where cleaning ranges from mutualism to parasitism (Sazima 2011), described as cheating in the cleaning symbiosis literature. A similar jolt response was also observed in the study by Vaughan et al. (2018) but no physical evidence of cheating, assumed to be exploitation of the exposed injury by shrimp, could be detected with sensitive quantitative methods. Indeed, the same authors questioned whether the proxy for cheating, the observed client jolt response, was a true representation of assumed cheating because jolting in their study

**Clownfish *Amphiprion polymnus* wound cleaned by *Ancylomenes* sp. cleaner shrimp**

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corresponded significantly with specific individual clients only. This suggested that jolt response was more likely an idiosyncratic client response (Vaughan et al. 2018). The observed improvement of the clownfish’s lesion over time by Ancylomenes sp. supports the consideration that other cleaner shrimp species support wound healing in injured fish.

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References

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Fig. 1 Clownfish with a wound: A) being cleaned by a shrimp on April 14, 2010; B) being cleaned by three shrimp on April 22, 2010; C) on July 15, 2010. Scale bars ≈ 2cm.