

## New observations of holothurian juveniles on Réunion reefs

Philippe Bourjon<sup>1\*</sup> and Elisabeth Morcel<sup>1</sup>

### Introduction

The questionnaire published in issue #19 of the SPC *Beche-de-mer Bulletin* (Shiell 2004a) brought together numerous information that had been collected *in situ* on the recruitment of sea cucumber juveniles (Bourjon and Conand 2015; Shiell 2004b). This article concerns 63 observations made in 2014 and 2015 by the authors on the reefs of Réunion. The seven juveniles of *Actinopyga echinites* and *A. mauritiana* that were observed in an area of recruitment during October and November 2015 are presented in another article in this bulletin (see p. 84).

### Observations and results

Observations were made at the reefs of St Gilles-Bains and Etang Salé, and the platform-reef of Grand Fond. Forty-seven of the sixty-three observations were made in the area of the reef front. All study sites in this area are characterized by strong hydrodynamism, a depth of less than 1 m, and abundant coral rubble. Forty-five juveniles were hidden under slab-shaped debris. In other areas, the majority of juveniles were also concealed under the same type of coral rubble. All juveniles were photographed and most of them were measured or

their length was estimated. The observation sites were not the same for each visit, thereby avoiding double reporting of individuals.

Because the size, or the age at first reproduction, is not known for all species (Kohler et al. 2009; Muthiga and Conand 2014), “juvenile” is not an accurate or reliable identifier. Size – an indirect indicator of age for individuals living in similar conditions – was therefore assessed in proportion to the size of the largest adults of the same species found on the same reef. The information concerning juveniles and young adults may also be useful because migration is observed at these stages in several species (Shiell 2004b).

The observations are grouped by families and species in Table 1 for Holothuriidae, and Tables 2 and 3 for Stichopodidae and Synaptidae. Furthermore, a 1.2-cm juvenile *Afrocucumis africana*, family Sclerodactylidae, was observed on 7 October 2015 near the front under a dead coral block.

Photos of each species (except *Actinopyga echinites* and *A. mauritiana*, see p. 84, this issue) are presented in Figures 1, 2 and 3.

**Table 1.** Juveniles of the family Holothuriidae.

Species	Length (contraction)*	Site	Habitat	Date	Time	Adults present
<i>Actinopyga echinites</i>	3 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	28/10/15	15:39	no
<i>Actinopyga mauritiana</i>	12 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	8/10/14	10:08	yes
	2.5 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	23/10/15	11:08	yes
	3.2 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	14/11/15	11:06	no
<i>Holothuria arenicola</i>	3 cm (C)	Saint Gilles	Sandy-detrital area, under dead coral	1/11/15	13:56	no
<i>Holothuria cinerascens</i>	5 cm (R)	Saint Gilles	Detrital area near a sea-grass bed, under dead coral	27/09/14	11:20	yes
	2 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	21/10/15	11:47	no
	3 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	11/11/15	10:37	yes
<i>Holothuria flavomaculata</i>	7 cm (HC)	Saint Gilles	Three individuals grouped under dead coral, outer reef flat detrital zone, near surf	25/12/14	10:00	no
	20 cm (HC)					
	22 cm (HC)					
	7 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	26/08/15	10:47	no
<i>Holothuria hilla</i>	2 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	15:51	no
	12 cm (R)	Saint Gilles	Sandy-detrital area, under dead coral	14/01/15	15:52	no
	11 cm (HC)	Saint Gilles	Sandy-detrital area, under dead coral	8/04/15	11:00	no

<sup>1</sup> Réseau d'observateurs volontaires “Les Sentinelles du Récif”, Réserve Naturelle Marine de La Réunion (GIP-RNMR) [“Sentinels of the Reef”, network of volunteer observers: Réunion Marine Park]

\* Author for correspondence: seizhavel@wanadoo.fr

Species	Length (contraction)*	Site	Habitat	Date	Time	Adults present
<i>Holothuria impatiens</i> (complex)	5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	22/11/14	11:40	no
	6 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	22/11/14	11:48	no
	12 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	5/12/14	14:56	no
	11 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	4/10/14	10:50	no
	6 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	23/09/15	11:01	no
	4 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	26/09/15	10:57	no
	5.5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	11:35	no
	4 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	15:40	no
<i>Holothuria leucospilota</i>	9 cm (HC)	Saint Gilles	Sandy-detrital area, under dead coral, with two adults	1/12/04	11:04	yes
	7 cm (HC)	Saint Gilles	Sandy-detrital area	23/05/15	10:32	yes
	5 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	23/05/15	10:40	no
<i>Holothuria nobilis</i>	15 (C)	Saint Gilles	Sandy-detrital area with sparse live coral	18/11/15	11:08	no
<i>Holothuria pervicax</i>	6 cm (C)	Etang Salé	Sandy-detrital area	7/05/14	09:56	yes
	6 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	6/08/14	10:26	no
	9 cm (R)	Saint Gilles	Sandy-detrital area, under dead coral	14/01/15	16:32	yes
	4 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/07/15	10:54	no
	5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	3/10/15	11:58	no
	7 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	23/09/15	10:22	no
	6 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	09:37	no
	5 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	10:06	no
	2.5 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	24/10/15	10:09	no
	8 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	14:00	no
	4 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	11/11/15	10:12	no
<i>Holothuria verrucosa</i>	9 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral; two individuals side by side.	6/08/14	11:17	no
	5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	26/08/15	10:31	no
<i>Labidodemas</i> sp.	3 cm (R)	Grand Fond	Coral reef platform, high hydrodynamics, under dead coral	22/02/15	15:34	no

\* C = contracted, HC = half-contracted, R = relaxed

**Table 2.** Juveniles of the family Stichopodidae.

Species	Length (contraction)*	Site	Habitat	Date	Time	Adults present
Stichopodidae	3 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	21/09/14	10:20	no
Stichopodidae (post-larve)	2 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	3/10/15	11:46	no
	2.5 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	15:04	no
<i>Stichopus chloronotus</i>	4.5 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	3/10/15	10:56	yes
	6 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	3/10/15	10:21	no
	5 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	09:57	no
<i>Stichopus herrmanni</i>	11 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	14:40	no
<i>Stichopus monotuberculatus</i>	8 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	5/12/14	14:54	no
	4.5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	10:32	no
	5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	7/10/15	10:32	no
	7.5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	10/10/15	10:35	no
	6.5 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	1/11/15	15:32	no
	10 cm (R)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	25/11/15	10:29	no

\* C = contracted, HC = half-contracted, R = relaxed

**Table 3.** Juveniles of the family Synaptidae.

Species	Length (contraction)*	Site	Habitat	Date	Time	Adults present
<i>Euapta godeffroyi</i>	16 cm (C)	Saint Gilles	Sandy-detrital area, under dead coral	18/10/14	10:10	no
	18 cm (HC)	Saint Gilles	Sandy-detrital area, under dead coral	29/08/15	10:40	no
	7 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	3/10/15	10:45	no
	18 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	28/10/15	15:32	no
<i>Synapta maculata</i>	30 cm (HC)	Saint Gilles	Sandy area	17/05/14	09:47	yes
	20 cm (C)	Saint Gilles	Sandy-detrital area	30/08/14	11:00	yes
	13 cm (C)	Saint Gilles	Sandy area	1/11/14	09:37	yes
	12 cm (C)	Saint Gilles	Sandy-detrital area	27/12/14	09:17	yes
	20 cm (HC)	Saint Gilles	Sandy-detrital area, under dead coral	21/03/15	10:22	yes
	5 cm (C)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	2/09/15	10:47	no
	18 cm (HC)	Saint Gilles	Outer reef flat detrital zone, near surf, under dead coral	11/11/15	10:53	no

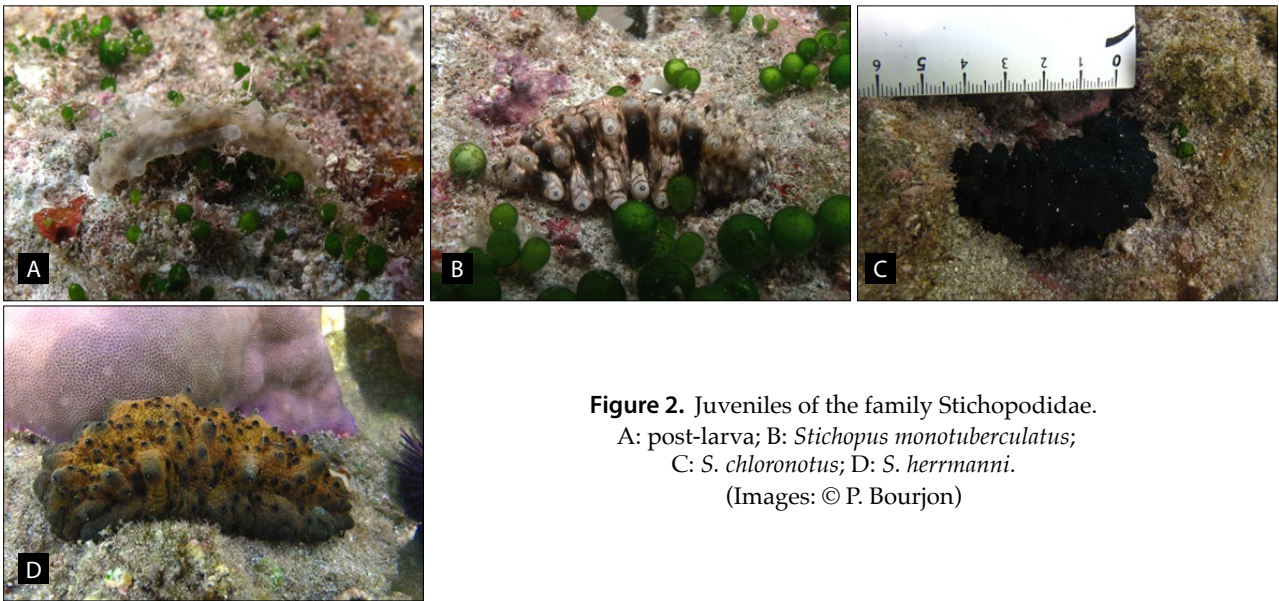
\* C = contracted, HC = half-contracted, R = relaxed

**Figure 1.** Juveniles of the family Holothuriidae.

A: *Holothuria arenicola*; B: *H. cinerascens*; C: *H. flavomaculata*;  
 D: *H. hilla*; E: *H. impatiens*; F: *H. leucospilota*; G: *H. nobilis*;  
 H: *H. pervicax*; I: *H. verrucosa*; J: *Labidodemas* sp.).

(Images: © P. Bourjon)





**Figure 2.** Juveniles of the family Stichopodidae.  
 A: post-larva; B: *Stichopus monotuberculatus*;  
 C: *S. chloronotus*; D: *S. herrmanni*.  
 (Images: © P. Bourjon)



**Figure 3.** Juveniles of the family Synaptidae (A: *Euapta godeffroyi*; B: *Synapta maculata*),  
 and Sclerodactylidae (C: *Afrocumis africana*).  
 (Images: © P. Bourjon)

Most observations were done in areas with strong hydrodynamic conditions where juveniles are usually hidden under small dead coral blocks. More sampling efforts in similar areas should provide valuable information about the early days of the reef life of many tropical sea cucumber species.

**Acknowledgments**

We thank Chantal Conand and François Michonneau for their encouragements and participation in the preparation of this communication.

**References**

Bourjon P. and Conand C. 2015. Juvenile holothurian observed at La Réunion (Indian Ocean). SPC Beche-de-mer Information Bulletin 35:64.  
 Kohler S., Gaudron S. and Conand C. 2009. Reproductive biology of *Actinopyga echinites* and other sea cucumbers from Reunion Island

(western Indian Ocean): A contribution for a regional management of the fishery. Western Indian Ocean Journal of Marine Science 8(1):97–111.  
 Muthiga N.A. and Conand C. (eds). 2014. Sea cucumbers, a poorly understood but important coastal resource: A regional analysis to improve management. Western Indian Ocean Marine Science Association Book Series No. 14. viii + 74 p.  
 Shiell G. 2004a. Questionnaire on the field observations of juvenile sea cucumbers. SPC Beche-de-mer Information Bulletin 19:41.  
 Shiell G. 2004b. Field observations of juvenile sea cucumbers. SPC Beche-de-mer Information Bulletin 20:6–11.  
 Shiell G. 2005. Information on juvenile holothurians: A contribution by D.B. James. SPC Beche-de-mer Information Bulletin 21:26–27.