

Natural spawning observations on Rodrigues Island, Indian Ocean

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The holothurian fauna from Rodrigues Island was described by Rowe and Richmond in 2004 and presents 29 species. Here we present the first observations of natural spawning of *Holothuria fuscocinerea*, a species that has not been recorded there previously, and also the presence of several holothurian species exhibiting spawning behaviours.

Species: *Holothuria (Stauropora) fuscocinerea*, Jaeger, 1833.

Location: North/East of Paté Reynieux, Mourouk cove, on the eastern coast of Rodrigues Island, Mauritius.

Date and time: 12 January 2013, daytime (16:00–16:30, local time). The climate is subtropical and it was summer time at the time of observation. Cloudy weather and relatively windy.



Figure 1. Male spawning specimen of *Holothuria fuscocinerea* releasing gametes in the water column (Image: Chloé Bourmaud).

Environmental parameters

Moon phase: New moon + 1 day.

Depth and tide: Specimens lying at a depth of approximately 2 m, 20 m from shore, on a dense seagrass bed. High tide (276 cm high) going down to 121 cm high with moderate water current that wobbled the erect specimens.

Bottom substrate: Soft substrate composed of fine grain sand of coral and volcanic origin covered with seagrass. The seagrass was colonised by epiphytes and an algal tuff. *Caulerpa* spp. macroalgae and whitish ascidians were relatively abundant in the seagrass bed. Two colonies of *Porites* spp. Corals were seen on the seagrass bed where the observation took place.

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Note: Only one specimen (*H. fuscocinerea*) was seen to release gametes in the water column at the time of observation. A few specimens of this species were erect and reasonably close to each other (three specimens in a 15 m radius).

Other holothurian species with spawning posture

The multispecies holothurian density on the spawning site was relatively important with several species (*Holothuria leucospilota*, *H. atra*, *Bohadschia vitiensis*) (Fig. 2 and 3) and synaptids (Fig. 3) present on the seagrass bed. Particularly, several specimens of *H. leucospilota* and *H. atra* were observed in the upright posture at the time *H. fuscocinerea* specimens were spawning, which is a typical mass-spawning behaviour. However, there was no evidence of gametes release by these species. No other echinoderm was seen to be spawning at the time of observation.

Several observations of spawning in the Indian Ocean have been published in previous issues of *SPC Beche-de-mer Information Bulletin* and are compiled here (Table 1). This contribution is the first from Rodrigues Island and involves several holothurians in a dense seagrass bed, showing simultaneous spawning behaviour. Synchronised spawning was described by Pearse et al. (1988) in British Columbia, involving specimens from several echinoderm classes, but this is not the case here, where only holothurians were showing the characteristic posture. These observations are of importance for broadcast spawners and the success of fertilisation.



Figure 2. *Holothuria leucospilota* (left) and *H. atra* (right) in the upright posture on a seagrass bed in Rodrigues Island.



Figure 3. Synaptids (left) and *Bohadschia vitiensis* (right) in the vicinity of the spawning holothurians.

Table 1. Natural spawning observations from the Indian Ocean recorded in the *SPC Beche-de-mer Information Bulletin* from issues 1 to 32 and present observations.

Species	Site	References	Year of observation	BDM issue	Observation	Note
<i>Holothuria nobilis</i>	Maldives	Reichenbach (1995)	1994	BDM 7	Three males spawned in holding tanks after being collected from the wild. Specimens were collected in June and October 1994.	
<i>Thelenota ananas</i>	Maldives	Reichenbach (1995)	1994	BDM 7	Two males and one female spawned in a holding tank after being collected from the wild. Males spawned first, and then the female released their gametes.	
<i>Bohadschia vitiensis</i>	La Saline Reunion Isl.	Durville (1996)	1995	BDM 8	Two specimens spawned in the late afternoon, at low tide, full moon.	
Undetermined	Seychelles	Durville (1998)	1997	BDM 10	Isolated male specimen spawning in the late afternoon. Undetermined.	Probably <i>H. fuscocinerea</i> .
<i>Holothuria atra</i>	India	Mohan (1999)	1998	BDM 11	Six observations of spawning in holding tanks, mostly males, from March to October 1998.	
<i>Bohadschia marmorata</i>	Petit trou d'eau Reunion Isl.	Rard (2004)	2004	BDM 20	Two males spawning in the late afternoon in 1 m depth.	The species is probably <i>B. vitiensis</i> .
<i>Pearsonothuria graeffei</i>	Vabbinfaru Isl. North Male Atoll Maldives	Muthiga (2005)	2005	BDM 27	A few specimens, close to each other, spawned in the late afternoon	
<i>Bohadschia vitiensis</i>	Trou d'eau Reunion Isl.	Gaudron (2006)	2006	BDM 24	Two specimens among 20 released gametes in the late afternoon, after a tropical storm and an increase in freshwater runoff into the fringing reef.	
<i>Stichopus chloronotus</i>	Étang Salé Reunion Isl.	Barrere and Bottin (2007)	2007	BDM 25	Several specimens spawned simultaneously over a period of two days, always in the late afternoon, two days after the full moon. The spawning period lasted for two days.	
<i>Pearsonothuria graeffei</i>	Aride Isl. Seychelles	Engelhardt (2007)	2007	BDM 27	Two erect specimens spawned in the mid-afternoon.	
<i>Stichopus monotuberculatus</i>	Saint Leu Reunion Isl.	Bollard (2008)	2008	BDM 30	The species was supposed to be nocturnal and spawned in the middle of the day (12:30).	
<i>Synapta maculata</i>	La Varanague Saint Leu Reunion Isl.	Ribes (2009)	2009	BDM 30	Several specimens spawned simultaneously.	
<i>Bohadschia vitiensis</i>	N'Gouja Mayotte	Bigot (2009)	2009	BDM 30	Specimen erected on a sandy bottom with sparse seagrass patches.	
<i>Holothuria fuscocinerea</i>	Rodrigues Isl. Mauritius	Bédier et al. (2013)	2013	This issue	Isolated male specimen spawning in the late afternoon.	Specimens from other species (<i>H. atra</i> , <i>H. leucospilata</i>) exhibited spawning behaviour but were not observed to release gametes.