

Table 1. Characteristics in morphology, life history and allerecognition in fourteen botryllid ascidians in the vicinity of Shimoda

	<i>Botryllus</i>								<i>Botrylloides</i>						
	<i>B. primigenus</i>	<i>B. horridus</i>	<i>B. scalaris</i>	<i>B. puniceus</i>	<i>B. sexiens</i>	<i>B. delicatus</i>	<i>B. schlosseri</i>	<i>B. promiscuus</i>	<i>B. simodensis</i>	<i>B. praelongus</i> *	<i>B. lentus</i>	<i>B. fuscus</i>	<i>B. lenis</i>	<i>B. violaceus</i>	
Colony															
Shape	flat	rugged	flat	flat	flat	flat	flat	flat	flat	flat	flat	flat	flat	flat	
Thickness (mm)	1.0-1.5	2.5-3.5	1.0-1.5	0.8-2.2	2.5-3.0	2.5-4.0	1.0-1.5	1.5-2.0	2.0-3.0	1.5-3.0	3.0-3.5	2.5-3.0	1.7-2.0	2.0-3.0	
Arrangement of zooids	orval	orval	ladder	ladder	ladder	ladder	orval	ladder	ladder	ladder	ladder	ladder	ladder	ladder	
Tunic	transparent, gelatinous, soft,	a little translucent, gelatinous	transparent, gelatinous, soft,	transparent, gelatinous, soft,	transparent, gelatinous, extremelv soft	transparent, gelatinous, extremelv soft	transparent, gelatinous, soft,	transparent, gelatinous, soft,	transparent, gelatinous, soft,	transparent, gelatinous, soft,	translucent, gelatinous, soft	translucent, gelatinous, soft	tranparent, gelatinous, very soft	transparent, gelatinous, soft,	
Zooid															
Length (mm)	1.0-1.5	2.5-3.0	1.5	2.8-3.8	2.5-3.0	2.5-3.0	2.0-2.8	1.5-2.0	2.0-2.5	1.5-3.0	3.1-3.5	2.2-2.7	2.0-2.3	2.5-3.0	
Number of tentacles (Large),(Small),(Minute)	L4, S4-8	L4, S4, M8	L4, S4	L4, S4	L6, S6	L4, S4	L4, S4	L4, S4	L4, S4, M1-2	L4, S4,M1-2	L4, S4, M1-2	L4, S4	L4, S4	L4, S4, M2-3	
Number of stigmatal	4	R9-11, L8-11	8	8-11	9-10	9-10	8	12-13	11	10-11	18	9	R9, L8	10-11	
Second row of stigmata	complete	complete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	incomplete	
Number of longitudinal vessels	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Number of stomach	9-10	9	8-9	9-10	11	8-9	8	8-9	9	8-9	9	8	8	9	
Pyloric caecum	large	large	large	large	large	large	large	large	small	small	small	small	small	small	
Asexual reproduction															
Peribranchial budding	all season	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	all seasons	
Number of buds in each zooid	R1-2, L1-2	R1-2, L1-2	R1, L1	R1-2, L1	R1, L1	R1, L1	R1-2, L 1-2	R1, L1	R1, L1	R1, L1	R1, L1	R1, L1	R1, L1	R2, L2	
Vascular budding	usually	infrequently	infrequently	sometimes	infrequently	sometimes	infrequently	infrequently	infrequently	infrequently	infrequently	infrequently	sometimes	infrequently	
Cycle of takeover	4-5 days	10 days	5-6 days	one week	5-6 days	one week	one week	one week	5-6 days	5-6 days	7-9 days	7-9 days	6-7 days	5-6 days	
Sexual reproduction															
Breeding season	Apr-Nov	jul-Sep	Jun-Nov	Apr-Jun	Jul-Dec	Jul-Dec	Mar-Nov	Jul-Dec	Jul-Sep	Apr-Feb	Jul-Aug	Jul-Sep	Jul-Oct	May-Aug	
Arrangement of gonads (position of ovary)	anterior to the testis	anterior to the testis	anterior to the testis	anterior to the testis	anterior to the testis	anterior to the testis	anterior to the testis	anterior to the testis	posterior to the testis	posterior to the testis	posterior to the testis	posterior to the testis	posterior to the testis	posterior to the testis	
Testis shape & color	hemisphere, white	rosette, grayish	rosette, grayish	rosette, milky-white	rosette, grayish	rosette, grayish	rosette, white opalescent	rosette, grayish	rosette, grayish	rosette, grayish	rosette, grayish	rosette, grayish	rosette, grayish	rosette, grayish	
Color of eggs	yellow	yellowish	orange	orange	yellow	yellow	yellowish	orange	yellowish orange	orange	orange	orange	pinkish or	yellow	
Production of larvae	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	ovoviviparous	viviparous	viviparous	viviparous	
Mature egg diameter (μ	170-180	250-260	220	240	150	250	230-250	230-250	250	200-250	300-330	160-200	90-100	<100	
Number of mature eggs	R1, L1	R1-2, L1-2	R1-2, L1-2	R1-5, L1-5	R2, L2	R1-2, L1-2	L & R: 1-3	R1, L1	R1, L1	R1, L1	R1, L1	R1, L1	R1, L1	R1, L1	
Brooding organ	pouch formed from atrial wall	no brooding organ	no brooding organ	no brooding organ	bowl-like organ formed from branchial sac	bowl-like organ formed from branchial sac	oviducal cup formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	pouch formed from atrial wall	
Embryo size just before hatching (μm)	-	350	-	-	-	-	280-300	-	300	-	1000-1100	800-1000	750-800	1000-1200	
Development to larvae	in one week	in 8 days	in 4-5 days	in one week	in 4-5 days	in one week	in one week	in one week	in 4-5 days	in 4-5 days	in 10-12 days	in 12-14 days	in 20 days	more than one month	
Release of larvae	about 4 days after degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	shortly before degeneration of parent zooids	5 days after degeneration of parent zooids	2 weeks after degeneration of parent zooids	after 6-7 times of takeover of blastozooids	
Larva															
Length (mm)	1.5	1.7-1.8	1.5	1.5	1.5-1.8	1.5	1.6	1.5-1.8	1.7-2.0	1.5-1.8	2.5-2.7	2.6-2.7	2.2-2.4	3	
Length of larval trunk (μm)	400	400-430	400	350	440	400	400	400	500	400-500	800	900	700	1000	
Number of larval	8	8	8	8	6	8	8	8	8	8	8	8	14-24	24-34	
Oozoid															
Length (μm)	-	520	-	500	-	750	500	900	900	700	1000	1000	850-900	1100-1200	
Number of tentacles	-	L4	-	L4	-	L4, S4	-	L4, S4	-	L4	-	-	-	-	
Number of protostigmata	-	5	-	4	-	8-10	L4, R4-5	9-10	-	5	6-7	7	8	-	
Number of stomach	-	4-5	-	4-5	-	5	5	5	-	* 5	-	-	-	-	
Number of buds	R1	R1	R1	R1	R1	R1	R1	R1	R1	R1	R1, L1	R1, L1	R1	R2, L1	
Colony specificity															
Present or absent	present	absent	present	present	present	present	present	present	present	present	present	present	-	present	
Starting stage of allerejection	after tunic fusion and before vascular fusion	-	after vascular fusion	after vascular fusion	after vascular fusion	after vascular fusion	before tunic fusion	before tunic fusion	before tunic fusion	before tunic fusion	before tunic fusion	before tunic fusion	-	before tunic fusion	
Allerejection when cut surface contact	occurs soon at the contact area	-	occurs after vascular fusion	occurs after vascular fusion	occurs after vascular fusion	occurs after vascular fusion	occurs soon at the contact area	occurs soon at the contact area	occurs soon at the contact area	occurs soon at the contact area	rejection does not occur	rejection does not occur	-	rejection does not occur	
Colony resorption															
Present or absent	present	-	present	present	present	present	present	present	present	* present	present	present	-	present	
References	Tokioka, 1953; Van Name, 1945	Saito & Okuyama, 2003	Saito et al., 1981a	Saito & Nagasawa, 2003	Saito et al., 1981a	Okuyama & Saito, 2001a	Boyd et al.,1990	Okuyama & Saito, 2002	Saito et al., 1981b	in submission	Saito & Watanabe, 1985	Saito & Watanabe, 1985	Saito & Watanabe, 1985	Saito et al., 1981b	