

Redescription of *Robsonella fontaniana* (Cephalopoda: Octopodidae)

C.M. IBÁÑEZ¹, R.D. SEPÚLVEDA², J. GUERRERO³ AND J. CHONG⁴

¹Instituto de Ecología y Biodiversidad, Departamento de Ciencias Ecológicas, Facultad de Ciencias, Universidad de Chile, Las Palmeras 3425, Casilla 653, Ñuñoa, Santiago, Chile, ²Instituto de Ecología y Evolución, Facultad de Ciencias, Universidad Austral de Chile, Casilla 567, Valdivia, Chile, ³Zoologisches Institut und Museum der Universität Hamburg, Martin-Luther-King-Platz 3, D-20146 Hamburg, Germany, ⁴Departamento de Ecología Costera, Facultad de Ciencias, Universidad Católica de la Santísima Concepción, Casilla 297, Concepción, Chile

The genus Robsonella Adam, 1938 belongs to the family Octopodidae and can only be identified by some characters present in males. In this work the species Robsonella fontaniana is redescribed from morphological and morphometric characters of 33 specimens (21 males and 12 females) collected on the central-south coast of Chile, during the years 2003 and 2004, and of 11 specimens (three males and eight females) obtained from the Zoological Museum of Hamburg. New diagnoses for the genus Robsonella and the species R. fontaniana are provided. Sexual dimorphism in R. fontaniana is evident by adult males having enlarged suckers and a shorter third right arm compared to the females. Some morphological characters such as ligula, radula and terminal organ diverticulum make it possible to distinguish this genus clearly from other genera. The ligula of the hectocotylized arm in Robsonella is characterized by a longitudinal groove, rounded tip, large calamus and seven copulatory lamellae. In addition, the first lateral tooth in the radula is crescent-shaped; this allows the identification of Robsonella regardless of sex.

Keywords: Cephalopoda; Octopodidae; *Robsonella*; Chile

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INTRODUCTION

D'Orbigny (1834–1843) described a small octopus from Chile and Peru as *Octopus fontanianus* d'Orbigny, 1834. The description was brief, and lacks necessary detail for modern systematic needs (Thore, 1959). Robson (1929) created the genus *Joubinia* to unite *O. fontanianus* and *O. campbelli* Smith, 1902. Adam (1938) replaced the genus *Joubinia* with *Robsonella* because the name was preoccupied by *Joubinia* Burger, 1904, a genus of Nemertea. Adam (1938) recognized two species within the genus: *R. fontaniana* and *R. campbelli* and extended the geographical distribution of *R. fontaniana* to Peru, Chile, Patagonia and Tierra del Fuego. Nevertheless, Robson (1929) differentiated and discussed a subspecies from Natal (Africa) and treated it as the subspecies *africana*.

Pickford (1955) re-examined specimens of *R. fontaniana* in the collections of the British Museum, and compared them with *R. campbelli*, which is considered a synonym of *Robsonella australis* (Hoyle, 1885) and *R. huttoni* (Benham, 1943), which had been described by Benham (1943) in the genus *Octopus* Cuvier, 1797. Pickford (1955) differentiated the species (*fontaniana*, *campbelli* and *huttoni*) based on number of gills lamellae, and doubted the validity of the genus *Robsonella*. Thore (1959), in the Lund Expedition, examined seven specimens from southern Chile, which he identified as *O. fontanianus*, implying he did not accept the generic designation of Adam (1938).

In his revision of New Zealand's octopuses, O'Shea (1999) reviewed specimens of *R. campbelli* and *R. huttoni*. He proposed that these species should be re-assigned to *Octopus*, and considered *Robsonella* to be synonymous with *Pinnoctopus* d'Orbigny, 1845. Previously, Sweeney & Roper (1998) had also classified *R. campbelli* in *Octopus*, but maintained the placement of *R. fontaniana* and *R. huttoni*.

Nevertheless, all the descriptions of *R. fontaniana* (i.e. Robson, 1929; Adam, 1938; Pickford, 1955; Thore, 1959; Nesis, 1987; Ré, 1998) were based only on male morphological characters (e.g. ligula, terminal organ diverticulum and enlarged suckers), because the females have been poorly described.

Due to little information about the genus, poor description of the species and little knowledge about its biology and systematics, the aim of this work is to diagnose the genus *Robsonella*, to redescribe the species *R. fontaniana* from male and female specimens, and to describe the morphological variation between the sexes.

MATERIALS AND METHODS

A total of 47 fresh and fixed specimens (27 males and 20 females) were used in this study. Thirty-three specimens (21 males and 12 females) of *R. fontaniana* were collected in intertidal pools and in the subtidal pools up to approximately 10 m depth at San Vicente Bay (36°31'S, 72°56'W) and Coliumo Bay (36°44'S, 73°10'W), in the central-south of Chile during 2003 and 2004 (Figure 1); eleven specimens (four males and seven females) obtained from the Zoological Museum of Hamburg (ZMH), Germany, were included as

Corresponding author:

C.M. Ibáñez

Email: christianibez@yahoo.com

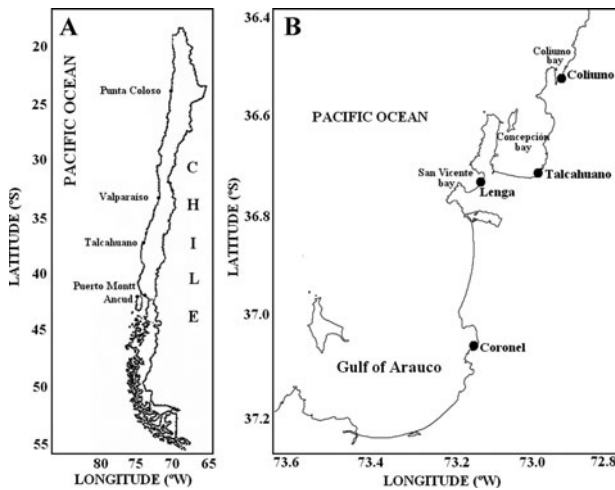


Fig. 1. (A) Map showing the Chilean localities where *Robsonella fontianiana* specimens were collected; and (B) enlarged map showing the localities where the fresh specimens were collected.

additional material; and three specimens (two males and one female from San Vicente Bay) were used for descriptions and then deposited in the Zoological Museum of the Universidad de Concepción (MZUC), Chile. In addition, two males were collected in Ancud (January 2000) and studied. These specimens were deposited in the Zoology Laboratory collection of the Universidad Católica de la Santísima de Concepción (LZUC), Chile. The syntype deposited in the Muséum National d'Historie Naturelle (MNHN), Paris, France, a female (MNHN 1055) was also obtained to verify the identification of the material. Comparative material was examined from the National Museum of Natural History (MNHN), Santiago, Chile.

In order to describe and compare the specimens, morphometric analyses with fresh and frozen (-20°C) specimens were conducted. The morphometric indices of Roper & Voss (1983) were used. The abbreviations used for each variable are as follow: TL, total length; TW, total weight; AL, maximum arm length; AL_{1-4} , arm length; AW, arm base width (the more width); HW, head width; HL, head length; MW, mantle width; DML, dorsal mantle length; VML, ventral mantle length; PA, pallial aperture; ED, eye diameter; SDn, sucker diameter (in the mid of the arms); SDe, enlarged sucker diameter; HcA, hectocotylized arm; HcASC, hectocotylized arm sucker count; OA, opposite arm length; LL, ligule length; CaL, calamus length; FuL, funnel length; FFuL, free funnel length; GiLC, gill lamellae count; WD_{A-E} , web depth; ASC_{1-4} , arm sucker count (all arms); SEM, scanning electron microscopy. Spermatophores ($N = 4$) were removed for study in a mature male (LZUC 0016).

SYSTEMATICS

Family OCTOPODIDAE d'Orbigny, 1840
Genus *Robsonella* Adam, 1938

DIAGNOSIS

Small sized octopuses: mantle saccular. Rough skin with supraocular papilla. Arms with biserial row of suckers. Third right arm hectocotylized in males. Terminal organ with a large second diverticulum. Enlarged suckers in males.

Funnel organ W-shaped. Ink sac present. Anal flaps present. Radula with seven teeth per transverse row; marginal plates present. Rachidian multicupid; first lateral teeth crescent-shaped (inverted U-shaped); marginal tooth unicuspid.

TYPE SPECIES

Octopus fontianianus d'Orbigny, 1834, 28: 1840.

SYNONYMY

Joubinia Robson, 1929: 187

Octopus Pickford, 1955: 163, Nesis, 1987: 308, O'Shea, 1999

INCLUDED SPECIES

Robsonella fontianiana (d'Orbigny, 1834)

Robsonella fontianiana (d'Orbigny, 1834) redescription
(Figures 2–5; Tables 1 & 2)

Syntype MNHN 1055. Type locality: Valparaiso, Chile by original designation (Figure 1).

SYNONYMY

Octopus fontianianus d'Orbigny, 1834: 28; 1840: 49; Tryon, 1879: 123 (Robson, 1929); Rochebrune & Mabile, 1889: 6 (Robson, 1929); Joubin, 1898: 23 (Robson, 1929); Lönnberg, 1898, 2(4): 49; Joubin, 1906: 1 (Robson, 1929); Lönnberg, 1907: 49 (Robson, 1929); ?*Octopus fontianianus* Winckworth, 1926: 325 (Robson, 1929). *Polypus fontianianus* Joubin, 1905

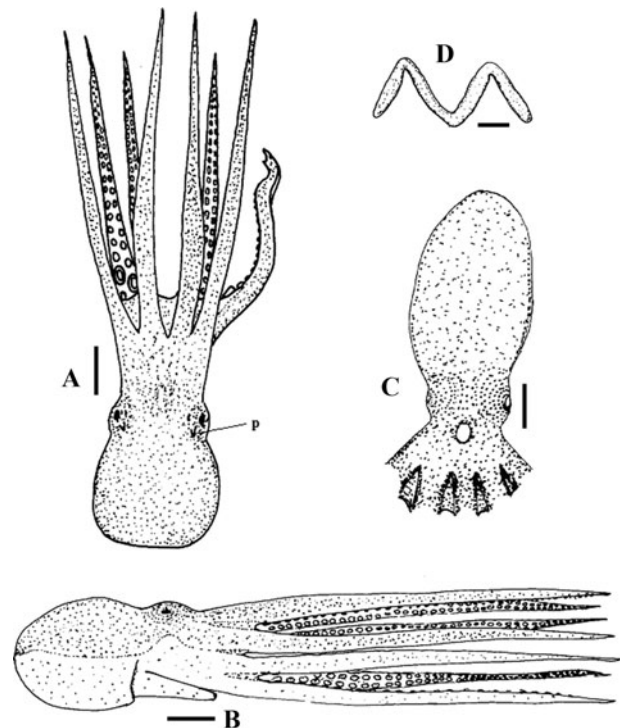


Fig. 2. *Robsonella fontianiana*: (A) male dorsal view (ZMH 11110). p, papillae; (B) female lateral view (ZMH 11107); (C) detail of the dorsal web white spot (MZUC 30800); and (D) funnel organ. Scale bars: a–c 10 mm; d, 1 mm.

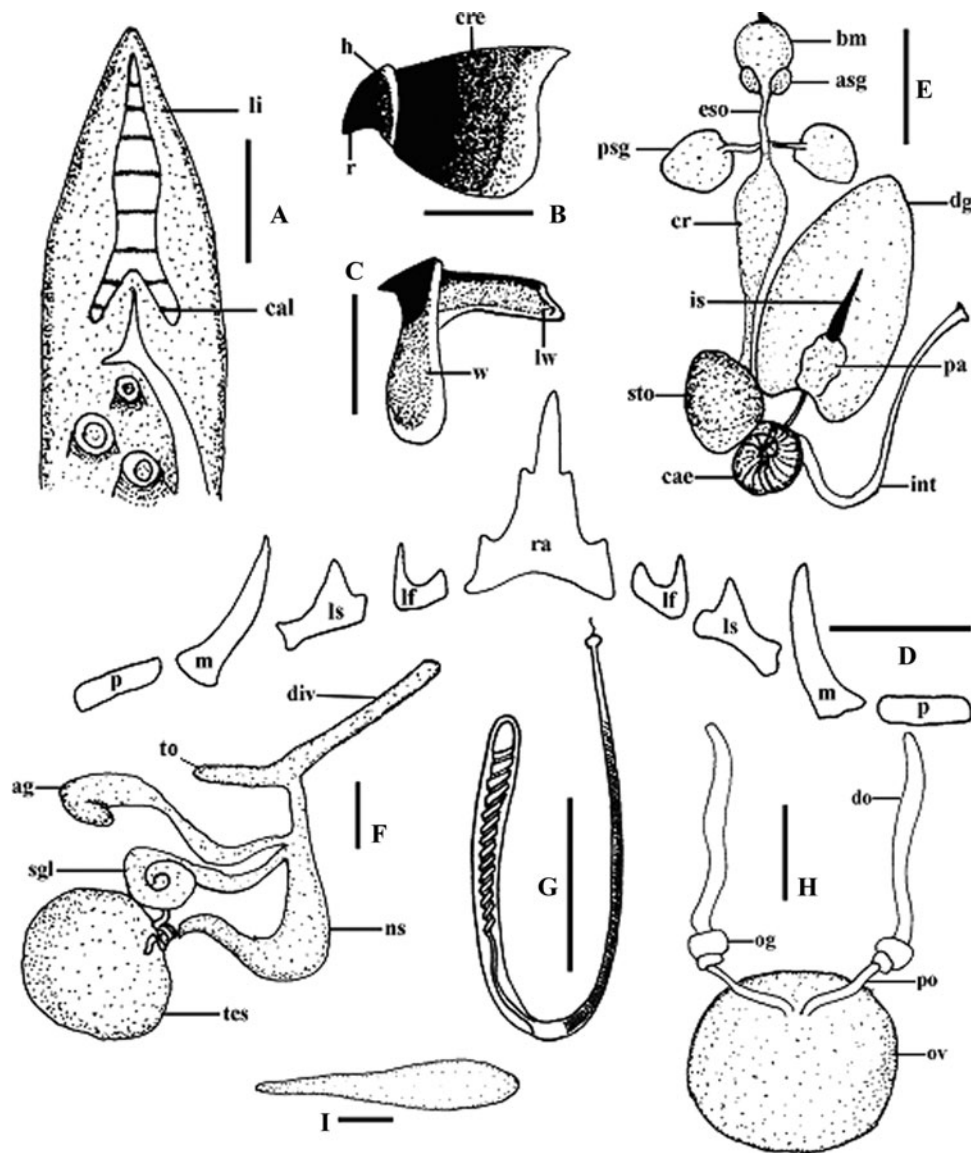


Fig. 3. *Robsonella fontaniana*: (A) Hectocotylized arm; li, ligule; cal, calamus; (B) upper beak; r, rostrum; h, hood; cre, crest; (C) lower beak; lw, lateral wing; w, wing; (D) radula; p, plate; m, marginal tooth; ls, second lateral tooth; lf, first lateral tooth; ra, rachidian teeth; (E) digestive tract; asg, anterior salivary glands; eso, oesophagus; cr, crop; is, ink sac; sto, stomach; cae, caecum; bm, buccal mass; psg, posterior salivary glands; dg, digestive gland; pa, pancreas; int, intestine; (F) male reproductive system; div, diverticulum; ag, accessory gland; sgl, spermatid gland; tes, testis; ns, Needham's sac; to, terminal organ; (G) spermatophore; (H) female reproductive system; do, distal oviduct; og, oviductal gland; po, proximal oviduct; ov, ovary; and (I) egg from immature ovarian. Scale bars: a–c and h, 5 mm; d, 0.3 mm; e and f, 10 mm; g and i, 1 mm.

(Massy, 1916); *Polypus fontani(e)anus* Dall, 1909: 181 (Robson, 1929); Massy, 1925: 224 (Robson, 1929); Berry, 1914a: 299 (Robson, 1929); *Polypus fontanianus* Robson, 1921: 437; Robson, 1925: 104 (Robson, 1929). *Joubinia fontaniana* Robson, 1929: 187; 1929a (10) 3: 607. *Robsonella fontaniana* (Adam, 1938; 121: 223). *Robsonella fontainianus*, Castellanos, 1967, 8: 177. *Joubinia fontainiana*, Castellanos & Meni, 1969, 1(2): 214. *Robsonella fontanianus* Norman & Hochberg, 2005: 136.

MATERIAL EXAMINED

Syntype: female DML 31 mm (Valparaiso, Chile) [MNHN 1055]; unknown date and collector. Three males and eight females from Chile. Immature female DML 32 mm [ZMH

11103], Valparaiso (33°40'S, 71°40'W); coll. Piening, 1927. Immature female DML 67 mm [ZMH 11104], Punta Coloso; coll. Paessler, December 1906. Immature male DML 31 mm, [ZMH 11105], Talcahuano; coll. Paessler, January 1930. Immature female DML 20 mm [ZMH 11106], Valparaiso; coll. Scheiding, 1903. Mature female DML 35 mm [ZMH 11107], Puerto Montt; coll. L. Fritz, 1900. Two females DML 30 and 20 mm, and one immature male DML 30 mm [ZMH 11108], Coronel; coll. Paessler, January 1920. Immature female DML 33 mm [ZMH 11109], West Coast South America; coll. Krause, 1903. Immature female DML 30 mm and one immature male DML 26 mm [ZMH 11110], Coronel; coll. Paessler, 1897. Four males and one female from Chile. Mature male DML 39 mm [MZUC 30800], Lenga (36°45'S, 73°10'W), colls. C.M. Ibáñez and R.D. Sepúlveda, February 2003 in 5 m

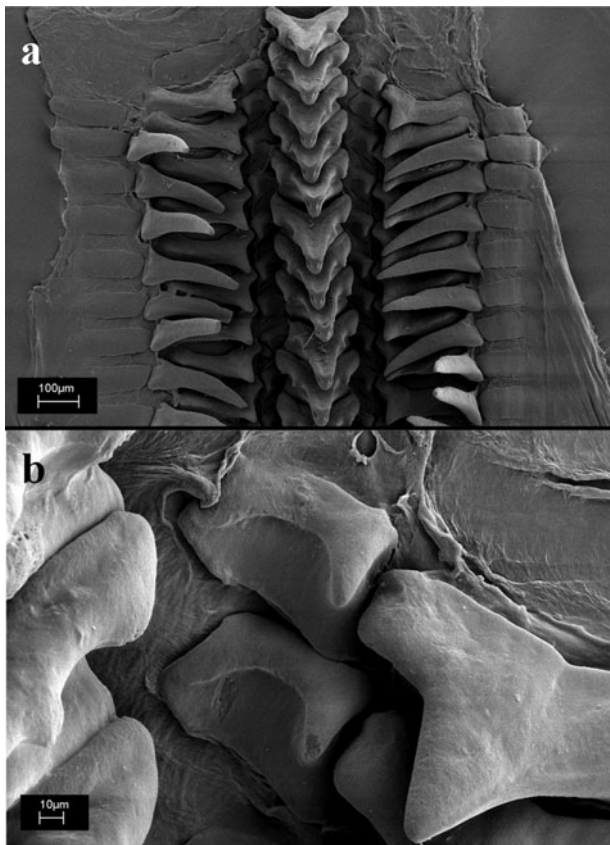


Fig. 4. *Robsonella fontaniana*: radulae scanning electron microscopy photographs. (A) Radula; and (B) detail of second lateral.

depth. Immature male DML 25 mm [MZUC 30799], Lenga ($36^{\circ}45'S$, $73^{\circ}10'W$), colls. C.M. Ibáñez and R.D. Sepúlveda, February 2003 in 3 m depth. Immature female DML 23 mm [MZUC 30801], Lenga ($36^{\circ}45'S$, $73^{\circ}10'W$), colls. C.M. Ibáñez and R.D. Sepúlveda, January 2004 in 5 m depth. Mature male DML 41 mm [LZUC 0015], Ancud ($41^{\circ}47'S$, $74^{\circ}28'W$), coll. J. Chong, January 2000 in 10 m depth. Mature male DML 45 mm [LZUC 0016], Ancud ($41^{\circ}47'S$, $74^{\circ}28'W$), coll. J. Chong during January 2000 in 10 m depth. Additional fresh material from Lenga and Coliumo, central-south of Chile, consisting of 21 males and 12 females collected by C.M. Ibáñez and R.D. Sepúlveda during January 2003 between 2–5 m depth, are summarized in the Table 1.

COMPARATIVE MATERIAL EXAMINED

Octopus mimus Gould, 1852. One mature female DML 135 mm [MNHN 5802], Northern Chile; coll. C. Reyes, May 2001.

Octopus tehuelchus d'Orbigny, 1834. One male DML 51 mm [MNHN 300130], Blue Bay, Magellan Strait; unknown collector, June 2000. One female DML 42 mm [MNHN 300131], Blue Bay, Magellan Strait; unknown collector, June 2000.

Enteroctopus megalocyathus (Gould, 1852). One female DML 80 mm [MNHN 300046], Ancud ($41^{\circ}47'S$, $74^{\circ}28'W$); coll. C.M. Ibáñez, January 2000. One male DML 103 mm [MNHN 5809], Tuamapu Channel ($43^{\circ}59'S$, $74^{\circ}00'W$); coll. C. Osorio, July 2002.

DIAGNOSIS

Small sized octopuses: rough skin with simple supraocular papilla; arms of similar length; web shallow of similar length; ink sac present. Third right arm hectocotylized in males and shorter than in females; with 47–60 suckers, ligula markedly enrolled sides and wide cheeks, with seven copulatory ridges. Terminal organ with a large second diverticulum. Enlarged suckers in males on arms II and III. 8–11 gill lamellae per demibranch. Radula with first lateral teeth crescent-shaped (inverted U-shaped). Rachidean multicuspoid.

DESCRIPTION

Animals small, with maximum total length of 273 mm. Mantle firm, oval, DML up to 69 mm in females (Ré, 1998), 65 mm in males (MWI = 72–115). Mantle separated from head by wide neck (Figure 2A). Head narrower than mantle (HWI = 53–90), eyes small, protuberant, with fleshy wart on each eye. Ocular diameter 1–6 mm. Funnel short, tubular, projecting from base of mantle aperture (FuLI = 55–75); free funnel 57–75% of funnel total length (Figure 2B). Funnel organ W-shaped (Figure 2D). Mantle aperture broad and partially closed.

Arms of similar length, long (70% TL), moderately narrow (AWI = 12). Third pair of arms in males sometimes shorter (Table 1). Biseriate suckers along entire arm, of greater size in proximal first third. Three suckers enlarged on second, third male arms (suckers 7–9) (Figure 5D; Table 1). Interbrachial membrane shallow (18 to 23% DML), extended along dorsal arm of each sector. Gill with 8 to 10 lamellae per demibranch (Figure 5E).

Third right arm hectocotylized, with 47–60 suckers; hectocotylus groove without pigmentation, without fold from interbrachial membrane to beginning of calamus; ligula small (4–10% AL_{3r}), longitudinal groove, rounded tip; calamus big (50% LL). Seven copulatory lamellae (Figures 3A & 5F).

Digestive tract

Beak dark with almost transparent edges. Upper beak short, rostrum curved, broad wings, slightly concave posterior edge (Figure 3B). Lower beak, rostrum short forming an acute angle with a sharp tip; wings narrow, long; crest long straight (Figure 3C). Radula with seven radular teeth, one marginal tooth per row: rachidian pentacuspoid, first lateral crescent-shaped (U-shape) with elongated posterior tip, second lateral unicuspid with wide base, marginal curved and long, marginal plates short (Figures 3D & 4A, B).

Buccal mass spherical, anterior salivary glands small, posterior salivary glands almost as large as buccal mass. Crop elongated without diverticulum, stomach short with enrolled caecum, building a coil. Oval digestive gland of dark colour, ink sac present on gland. Intestine short without modifications (Figure 3E).

Male reproductive tract

Testes oval. Vas deferens short with several turns. Spermatophoric gland with posterior part twisted. Accessory gland broad, Needham's sac large, elongated. Terminal organ short with long diverticulum, ampoule on base (Figure 3F). Spermatophore extremely long, slender (average length 49.8 mm), sperm reservoir coiled with 14–17 coils,

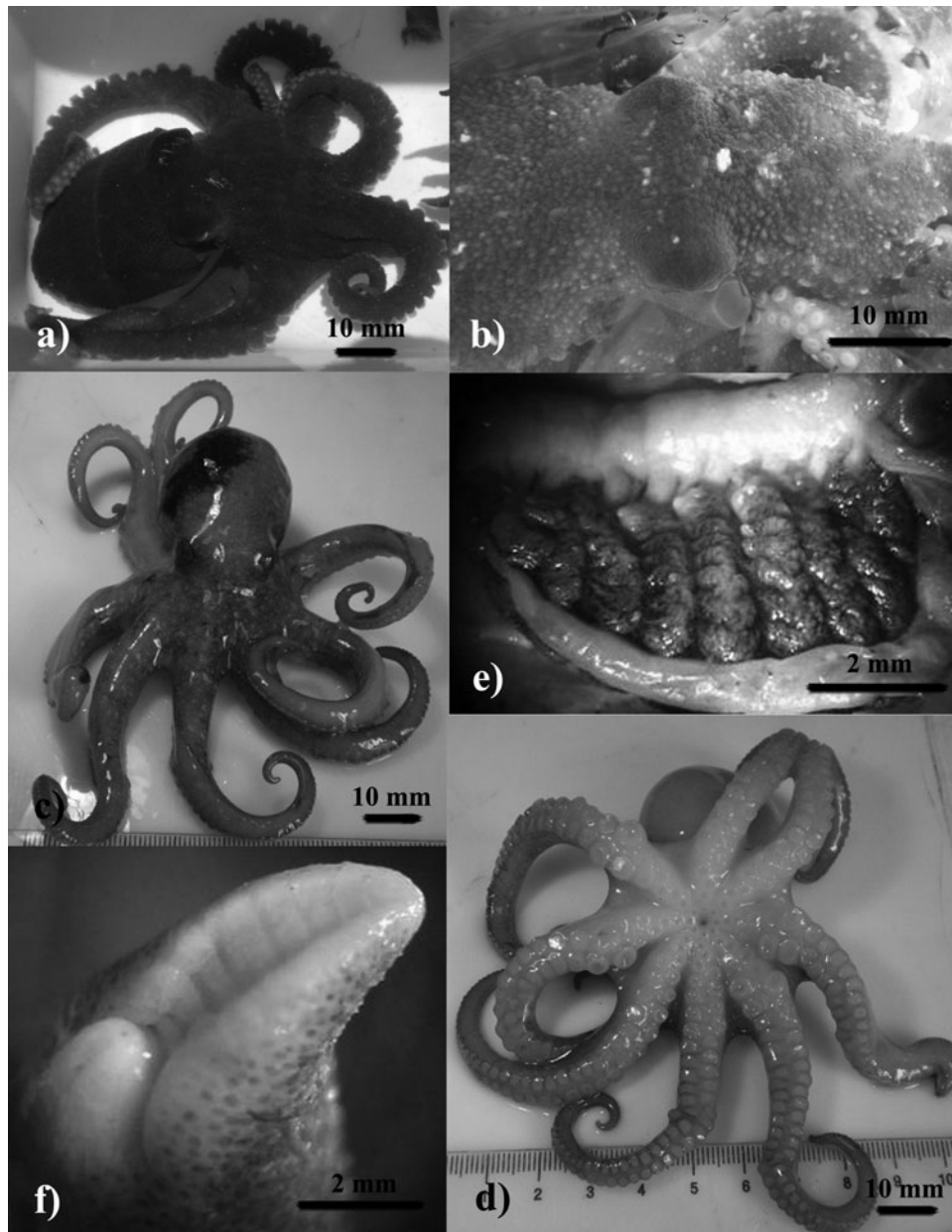


Fig. 5. *Robsonella fontaniana*: photographs of male specimens of *Robsonella fontaniana*. (A) and (B) live adult; (C) fresh adult specimen; (D) fresh adult, with enlarged suckers on arms II and III; (E) demibranch; and (F) hectocotylus.

sac with very fine striations occupying about one-third of total spermatophore length (Figure 3G).

Female reproductive tract

Ovary spherical, ivory colour. Proximal oviducts moderately long, oviductal gland small, distal oviducts long (Figure 3H). Eggs long, club shaped (Figure 3I).

Skin colour brown-reddish to grey covered by tiny warts, coloration variable with mode of preservation (Figure 5A, B, C & D). Dorsal white spot located anterior to head (Figure 2C & 5B), more visible in fresh, live specimens than in preserved ones.

REMARKS

The syntype [MNHN 1055] of the species is an immature female in moderate preservation state. The head is perforated so that one eye is badly damaged, and part of the digestive

tract is partly ruptured. The posterior salivary gland is clearly visible. The funnel organ is not recognizable. Arms are complete. Arms IV are shorter than the others. Sucker counts were only possible on one arm; on the other arms suckers are missing. After more than 178 y in alcohol no pigmentation is preserved. Only one female and three males were mature specimens in the studied material (Table 2).

DISTRIBUTION AND HABITAT

Robsonella fontaniana is a benthic species from cold waters which is distributed in almost all the south coast of South America: the species has been reported from the north of Peru in the Pacific Ocean and from Puerto Madryn (Argentina) in the Atlantic Ocean (41°S) to the Cape Horn in Chile (56°S) (d'Orbigny, 1834–1843; Nesis, 1987; Rocha, 1997; Ré, 1998). The bathymetric range extends from the

Table 1. *Robsonella fontaniana*: mean morphometric (mm) and meristic data of 21 immature males and 12 immature females.

	Immature males				Immature females			
	Min	Mean	Max	SD	Min	Mean	Max	SD
TL	99	201.6	273	45.2	81	164.9	209	35.5
TW (g)	51	29.5	60.5	13.4	23.47	15.4	28.82	6.7
AL	70	138.8	200	46.8	58	120.3	157	26.0
AL1	60	124.8	185	36.6	44	102.1	130	26.5
AL2	69	129.6	198	32.3	57	111.0	151	27.6
AL3	50	127.7	200	38.2	32	113.0	157	30.2
AL4	70	125.8	170	28.9	40	108.7	150	27.7
AW	3	6.3	9	2.0	3	5.4	7	1.2
HW	7	16.4	21	3.6	10	15.2	18	2.6
HL	3	6.8	22	3.7	3	5.3	7	1.2
MW	18	30.9	39	5.4	15	24.8	33	5.4
DML	29	49.4	65	9.3	22	40.5	54	9.3
PA	11	18.7	29	7.3	11	16.1	23	3.9
ED	1	3.8	6	1.1	2	3.3	5	0.8
Sde	2	5.1	8	1.4				
SDn	1	2.8	4	0.9	2	2.4	4	0.7
HcA	56	94.1	160	21.7				
HcASC	47	53.5	60	3.2				
OA	50	128.7	200	37.3				
LL	3	6.5	9	2.1				
CaL	1	3.5	5	1.0				
FuL	11	18.8	25	3.3	10	15.9	20	3.0
FfuL	4	9.0	12	1.9	4	7.1	10	1.8
GiLC	8	9.1	10	0.4	9	9.4	10	0.5
WDA	9	17.5	26	4.8	5	14.3	21	3.9
WDB	9	20.0	29	4.7	11	18.1	28	4.9
WDC	10	21.8	31	4.3	9	16.3	23	4.0
WDD	11	20.0	28	4.3	10	17.8	26	4.4
WDE	10	17.4	26	4.6	6	13.4	21	4.0
ASC1	72	112.0	138	19.1	18	113.5	142	33.2
ASC2	64	113.2	152	21.3	82	114.0	142	19.7
ASC3	50	110.4	156	23.6	102	123.5	150	12.4
ASC4	72	109.3	146	20.9	70	118.3	140	20.1

Min, minimum; Max, maximum; SD, standard deviation. For all other abbreviations, see Materials and Methods section.

intertidal to 90 m depth along the coast of Argentina (Ré, 1998). At Chile, *R. fontaniana* has been found in the rocky intertidal to 55–70 m depth (Osorio *et al.*, 1979, 2006). Thore (1959) recorded a female from 225 m near Puerto Montt, Chile (~40°S), and Osorio (personal communication, 2007) found two females (13 and 11 mm DML) to 210 m from Corcovado Gulf (~43°S) and other two females (15 and 17 mm DML) to 141 m from Deserto Island (~42°S). The species can be found occasionally in intertidal pools and rocky places on the shallow subtidal where it generally takes refuge beneath rocks, though it can also bury itself in the sand. Apparently, the abundance of *R. fontaniana* is correlated with the abundance of small crustaceans, which constitute the main food source (Sepúlveda *et al.*, 2004).

ETYMOLOGY

This species was named in honour of M. Fontaine.

DISCUSSION

The indicated morphological characters described clearly distinguish this genus from *Octopus*. The ligula has no

Table 2. *Robsonella fontaniana*: morphometric (mm) and meristic data of three mature males and one mature female.

	LZUC 0015	MZUC 30800	LZUC 0016	ZMH 11107
	Male	Male	Male	Female
Sex				
TL	160	160	200	152
TW (g)	25.3	16.2	24.4	–
AL	111	110	165	–
AL1	100	96	140	91
AL2	111	110	165	117
AL3	107	103	145	113
AL4	77	94	142	104
AW	8	5	6	7
HW	19	17	18	22
HL	7	6	5	–
MW	28	26	31	35
DML	41	39	45	35
PA	22	19	21	–
ED	3	3	4	–
SDe	4	4	5	–
SDn	2	3	4	2
HcA	74	76	105	–
HcASC	53	54	52	–
OA	107	103	145	–
LL	7	5	7	–
CaL	5	3	3	–
FuL	22	17	19	10
FFuL	10	9	10	6
GiLC	10	9	9	9
WDA	15	16	20	13
WDB	18	20	27	11
WDC	21	23	27	9
WDD	22	17	24	8
WDE	19	13	21	10
ASC1	134	128	110	–
ASC2	142	122	142	150
ASC3	124	118	114	130
ASC4	94	106	122	–

For abbreviations, see Materials and Methods section.

fold from the interbrachial membrane to the beginning of the calamus, whereas *Octopus* frequently possesses this fold. The rachidian tooth of the radula in *O. mimus* is tricuspid while in *R. fontaniana*, *O. tehuelchus* and *E. megalocyathus* it is multicuspid (Ré, 1998; Guerra *et al.*, 1999). In *R. fontaniana*, the first lateral tooth is crescent-shaped; in *O. mimus*, *O. tehuelchus* and *E. megalocyathus* the first lateral tooth is unicuspid with the tip on the central area (Ré, 1998; Guerra *et al.*, 1999). The second lateral teeth are very similar in many octopus species (Nixon, 1998), but the third lateral teeth are sabre-like in *R. fontaniana* and *O. mimus*, whereas they are hook-like in *O. tehuelchus* and *E. megalocyathus* (Ré, 1998; Guerra *et al.*, 1999). Thore (1959) used the degree of robustness of the hectocotylus to separate *Octopus* from *Robsonella*. We consider that it is not a very useful character at a generic level to differentiate *Robsonella* from other genera, because hectocotylus shape has intra/inter-specific variability and is strongly affected by preservation. Likewise, the terminal organ diverticulum can be a useful character in the differentiation between *Octopus* and *Robsonella*. *Octopus* has a small diverticulum and *Robsonella* has a large one, although Pickford (1955) suggested the opposite. The first lateral tooth of the radula is a very important character for the genus *Robsonella*, which in turn permits its identification independent of

Table 3. Morphological, morphometric and meristic comparison of sympatric octopuses from southern tip of South America based on literature and examined individuals (see comparative material examined).

Species	DML (mm)	Skin	Supraocular Papillae	GiLC	HcASC	Funnel organ	Terminal organ	Ligula size (LL/AL)	Reference
<i>Robsonella fontaniana</i>	60	Rough	Simple	8–10	47–60	W	Large	Medium 8–11%	This study
<i>Octopus mimus</i>	190	Smooth	2–3	7–8	129–149	W	Short	Very small 1.1–1.5%	Guerra <i>et al.</i> (1999)
<i>Octopus tehuelchus</i>	98	Smooth	Simple	5–7	85	UU	Short	Small 2–2.5%	Ré (1998)
<i>Enteroctopus megalocyathus</i>	280	Smooth	Absent	11–13	78	W	Large	Large 11–22%	Ré (1998)

sex. Thore (1959) mentions that the systematic value of the radula was little known at that time. Nevertheless, Adam (1938) indicated that the lateral tooth of the radula had two tips. Nowadays, it is well known that this organ is of great systematic value at the generic and specific levels (Nixon, 1998). The teeth patterns in the *Octopus* species are similar, and the variability is high, but subtle differences are apparent (Nixon, 1998). For this reason the comparison of radulae from congeneric octopods has been used for to separate species (Adam, 1983; Nixon, 1998; Ibáñez *et al.*, 2006). Consequently, a few meristic characters such as the number of branchial lamellae, the number of suckers and the copulatory lamellae of the hectocotylus are also being currently used, with the two latter often being more reliable (Toll, 1988; Muus, 2002). We found that the spermatophore of *R. fontaniana* is as long as the mantle confirming the observations from Pickford (1955) and Thore (1959).

Robsonella fontaniana can be distinguished from other sympatric octopus species from the southern tip of South America by the presence of a dorsal white spot anterior to the head in fresh and live specimens, the number of suckers on the hectocotylized arm, the number of branchial lamellae, and the cheeks of the ligula. Moreover, *R. fontaniana* is different in other morphometric and meristic characters (Table 3). By examining the meristic and morphometric measurements of the female specimen captured at San Vicente Bay and identified by Thore (1959) as *Octopus vulgaris* Cuvier, 1797 (= *Octopus mimus* Gould, 1852; Guerra *et al.*, 1999), we identified the specimen as *R. fontaniana*. The number of branchial lamellae of 10 to 11 distinguishes it from *O. mimus*, which has 7 to 8 branchial lamellae. Although it is a juvenile specimen (DML 18 mm), it is not an *O. mimus* (more details in Guerra *et al.*, 1999: 53).

Toll (1998) suggests *R. fontaniana africana* should be designated as *nomen dubium*, because the little information available (one female) is insufficient to determine the identity of this subspecies. O'Shea (1999) stated that the specimen is a small immature female related more to *Octopus vulgaris* Lamarck, 1798. At the moment this species has an 'unresolved' status (Norman & Hochberg, 2005). A careful revision of the Natal Museum specimen and the collection of additional material of this species from the Kwa Zulu-Natal area are essentials for resolving the status of this subspecies. A description of the specimen's radula would help to clarify its systematic placement.

Sweeney & Roper (1998) and Sweeney (2001) classified *R. campbelli* in *Octopus*, but maintained the placement of *R. fontaniana* and *R. huttoni*. In a recent work, Norman & Hochberg (2005) proposed that both *campbelli* and *huttoni* are valid in an 'unplaced' genus.

Finally, we think that morphological and molecular phylogenetic analyses are required to clarify the origin, spatial and temporal diversification of the species of the genus *Robsonella* and its allied species.

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Correspondence should be addressed to:

C.M. Ibáñez
 Instituto de Ecología y Biodiversidad
 Departamento de Ciencias Ecológicas
 Facultad de Ciencias
 Universidad de Chile
 Las Palmeras 3425
 Casilla 653
 Ñuñoa
 Santiago
 Chile
 email: christianibez@yahoo.com