

## *Inia geoffrensis humboldtiana* Behavioural Catalogue

#	CODE	BEHAVIOUR	DEFINITION	REFERENCE
<b>LOCOMOTORY &amp; POSTURAL BEHAVIOUR</b>				
1	SWM	Directional swim	Swimming in regular circular pattern around the tank	Caldwell M.C., Caldwell D.K. & Evans W.E., 1966
2	SRD	Random swim	Dolphins showed frequent changes in heading that sometimes appeared as a transition behaviour between other behavioural states	Constantine R., Brunton H. D. & Dennis T., 2004
3	EXP	Exploratory behaviour	Scanning perpendicular/horizontal relative to bottom.	Herzing D.L., 1995
4	TRU	Tank rub	They often rub their bodies against an object, floor, the bottom, the side of the basin. When swimming on the side, belly in front of the wall, they keep a contact of their flippers with the wall	Sylvestre J.P., 1985
5	SIN	Sink	Vertical descent through the water column from the surface or interface by a dolphin [...] without making forward progress	Muller, M., Boutiere, H., Weaver, A. & Candelon, N., 1998
6	LIE	Lie	The animals often rest together on the bottom of the basin, turning the head, in different directions, observing the other "tonina" or anything in the pool	Sylvestre J.P., 1985
7	VST	Vertical stand	Dolphin hangs/suspends itself vertically with its head up or down in mid-water column.	Miles J. A. & Herzing D. L., 2003
8	RST	Rest	The animals floated at the surface of the water without any body movement. The blowhole only was exposed to the air, the breathing frequency was reduced, and the small eyes appeared to be closed.	Renjun L., Gewalt W., Neurohr B. & Winkler A., 1994
9	FKO	Fluke out	Botos show the tail above the surface	da Silva W.M.F., 2002
10	OMT	Open and close mouth	Sometimes, the orinoco dolphin was motionless with the jaws opened for a long time (10-20 sec) and gently shaking his head to left and right	Sylvestre J.P., 1985
11	DAR	Dorsal arch	Head and flukes bent outwards extending the belly region and compressing the back.	Miles J. A. & Herzing D. L., 2003
12	VAR	Ventral arch	Dolphin body aligns in a crescent shape usually head up and perpendicular to the sea floor. Head and flukes are bent towards each other, extending the back and compressing the belly region.	Miles J. A. & Herzing D. L., 2003
13	FLX	Flexion	The fluke and caudal peduncle moved ventrally and as the flexion reached its maximum, the tail approached an angle of 45 degrees from the horizontal. Often the head also bent ventrally. At the maximum the entire body formed an arch, and the muscles are taut. Then the animal relaxed and the tail was raised dorsally	Tavolga M.C. & Essapian F.S., 1957
14	SPY	Spy-hop	Botos show the head above the surface	da Silva W.M.F., 2002
15	LOO	Loop	The Orca emerging out of the water at an acute angle, brings its ventral side to the surface. It then returns into the water describing a large loop.	Martinez D.R. & Klinghammer E., 1978
16	SOM	Somersault	Tail dorsally/ventrally over head in a somersault.	Ostman J.S.O. & Folkens P.A., 1996
17	ROL	Roll	The body is rotated through 360° on the longitudinal axis to either side of the dolphin.	Renjun L., Gewalt W., Neurohr B. & Winkler A., 1994
18	STP	Stop	Suddenly stops dead in water after swimming forward.	Ostman J.S.O. & Folkens P.A., 1996
19	JRK	Jerk	This behaviour consisted of any slight, rapid jerking of the body.	Nelson D.L. & Lien J., 1994
20	HJR	Head-Jerk	A rapid lateral or vertical jerk of the head	Connor R.C., Wells R.S., Mann J. & Read A.J., 2000
21	PJK	Pectoral-jerk	Rapid, jerky movements back and forth with, generally extended, flippers.	Ostman J.S.O. & Folkens P.A., 1996
<b>SOCIAL BEHAVIOUR</b>				
22	CNT	Contact	They frequently keep a contact of a part of body (in particular the flippers) with the body of their companion	Sylvestre J.P., 1985
23	RUB	Rub	The Orinoco dolphins rub their bodies against the body of the other companion	Sylvestre J.P., 1985
24	BND	Bond	Sometimes they swim by keeping a contact of [...] fluke or flippers in contact with the body of its companion as the pair swim together	Sylvestre J.P., 1985
25	NUD	Nudging	Nudging each others' bodies with their snouts	Wursig B. & Wursig M., 1979
26	NBL	Nibbling	The male nibbling the female's flipper and flukes	Best R.C. & da Silva V.M.F., 1989
27	MOU	Mouthing	One dolphins laying his beak for a short time between the open jaws of the other	Pilleri G., 1980
28	BGP	Beak-genital propulsion	An animal invites a second animal to come up from below it and place the tip of its rostrum in its genital slit. The lower animal often turns partially on its side, sometimes supporting the horizontal flukes of the upper animal from its head to its outstretched pectoral flippers. In this position, the lower animal, its tail bent down slightly from the horizontal, propels the upper animal forward, only breaking from the pattern to rise for breaths of air. Sometimes it swims belly-up or dorsum-up during such propulsion	Johnson C.M. & Norris K.S., 1986
29	PYG	Piggyback	Two dolphins riding on top of each other, either three adult males swimming above one of the subadults, or vice versa	Pilleri G., 1980
30	POI	Pointing	Dolphins positioned head to head with respect to one another	Dudzinski K.M., 1996
31	DOM	Direct open mouth	Opened mouth directed at another; often with abrupt vertical head movement	Samuels A. & Gifford T., 1997

32	JCL	Jaw clap	Dolphin opens and shuts its jaws rapidly [...] once or consecutive times. A loud clapping sound is made.	Miles J. A. & Herzog D. L., 2003
33	CHA	Chase	Individual swam synchronously around the tank and chase	Best R.C. & da Silva V.M.F., 1989
34	PUS	Push	Pushing body with its melon, rostrum, pectoral fins and body	Dudzinski K.M., Sakai M., Masaki K., Kogi K., Hishii T. & Kurimoto M., 2003
35	RHT	Rostrum hit	One dolphins hits another dolphin with its rostrum	Dudzinski K.M., 1996
36	THT	Tail hit	One dolphin uses its fluke to hit another dolphin's head or body, can be done mid-water column or at the water surface	Miles J. A. & Herzog D. L., 2003
37	BSL	Body slam	A charging dolphin slams into another with any part of its body other than its rostrum, peduncle and tail, fins and peccs.	Connor R.C., 1995
38	BIT	Bite	One animal draws the open jaws across another animal's body or extremities; often leaving parallel lines	Pryor K., 1990
39	CLS	Clasp	A mother swims belly-up at the surface with the calf between the pectoral fins	Mann J. & Smuts B., 1999
40	HLD	Hold down	Force the smaller animal toward the bottom	Caldwell M.C., Caldwell D.K. & Evans W.E., 1966
<b>SEXUAL BEHAVIOUR</b>				
41	BTB	Belly to belly swim	Two dolphins swimming slowly anticlockwise belly to belly, with the adult male swimming on its front above one of the subadults swimming on its back	Pilleri G., 1980
42	GIN	Genital inspection	Includes one dolphin inspecting the genital region of a second while producing a burst pulsed sound. No physical contact is observed	Dudzinski K.M., Thomas J.A. & Douaze E., 2002
43	GOO	Goose	Rostro-genital contact in which one individual moves its rostrum into the genital area of another, gently or roughly.	Connor R.C., Wells R.S., Mann J. & Read A.J., 2000
44	GRD	Genital rub on dolphins	Genital rubs (on conspecifics)	Herzog D.L. & Johnson C.M., 1997
45	ERE	Erection	Slowly swimming, the penis began to protrude out of the genital orifice. Just after, the cetacean bent itself in two parts, the head and the fluke pointed down, during 3 to 4 sec and returned to its normal position	Sylvestre J.P., 1985
46	PIN	Penis insertion	The adult male tried briefly to insert its erect penis into the blowhole of one of the juvenile male. The adult male swimming underneath the younger inserted its penis (in erection) into its genital hole; the male, in such case, was observed attempting insertion into the female's blowhole or between her tail flukes	Sylvestre J.P., 1985; McCusker, 1975
47	FMO	Fin/Fluke mount	Slowly progressing animals often swam with the tip of the dorsal fin or flukes of one dolphin inserted into the genital slit of its partner.	Saayman G.S., Tayler C.K. & Bower D., 1973
48	MAA	Mate attempts	When the male clasped the female with his flippers and making pelvic thrusts attempted to intromit his erect penis into the vagina.	Saayman G.S., Tayler C.K. & Bower D., 1973
49	MAT	Mate	Ventral contact between two dolphins, intromission observed	Slooten E., 1994
<b>AERIAL BEHAVIOUR</b>				
50	PSL	Pectoral slap	Slapping the pectoral fin on the water surface	Mann J. & Smuts B., 1999
51	TSL	Tail slap	Flukes raised above the surface and ventral/dorsal side slapped downward, usually making a loud, percussive sound.	Shane S.H., 1990
52	RSL	Rostrum slap	A dolphin, on its side or belly-up, raises its head out of the water and slaps its rostrum on the water surface. May be light or hard.	Connor R.C., 1995
53	HSL	Head slap	A dolphin, on its side or belly-up, raises its head out of the water and slaps the side of its head on the water surface. May be light or hard.	Connor R.C., 1995
54	DSL	Dorsal slap	The foresection is elevated above the surface with the ventrum uppermost and dropped backward, landing noisily on the dorsum. Occasionally, the animal will emerge in a dorsal or lateral position and rotate on the long axis before dropping back. The end of the tailstock may be kicked out from under the body before landing	Muller, M., Boutiere, H., Weaver, A. & Candelon, N., 1998
55	VSL	Ventral slap	A dolphin raises itself out of the water to at least the dorsal fin or leaps clear of the water and then slaps its belly on the water surface. May be light or hard.	Connor R.C., 1995
56	SSL	Side slap	The dolphin comes out of the water and returns back to water on its side. Very often, only half or two-thirds of the body length is out of the water; the tail usually remains underwater	Bel'kovich V.M., Ivanova E.E., Yefremenkova O.V., Kozarovitsky L.B. & Kharitonov S.P., 1991
57	QLE	Quasi-leaps	When surfacing, the melon, tip of the rostrum and long dorsal keel are out of the water simultaneously in a very conspicuous way. The boto does a high-arching roll in which these parts appear sequentially thrust well out of the water. The tail is rarely raised out of the water prior to a dive	da Silva W.M.F., 2002
58	LEP	Leap	Entire Body clears the water (any Height). Exit and enter head first with venter/dorsum/side facing down.	Shane S.H., 1990
<b>BUBBLE RELATED BEHAVIOUR</b>				
59	BUB	Bubble	Dolphins [...] expel air from their blowholes, generating large, amorphous bubbles that rise quickly to the surface	Marten K., Shariff K., Psarakos S. & White D. J., 1996
60	BUR	Bubble ring	Air bubble ring produced by air from the blow-hole	Gewalt W., 1989
61	BUS	Bubble stream	The animals also produced a column of small air bubbles coming from their blow holes (they were either blown all at once or gradually)	Delfour F. & Aulagnier S., 1997

62	BUM	Bubble mouth	<i>Inia</i> puts its rostrum out of the water, opens the long beak and takes some air in the mouth. After that the animal dives to the bottom of the pool waiting for the end of the self-produced water turbulences. Then it opens a small part of one side of the mouth bringing out air bubbles which rise in a row.	Gewalt W., 1989
63	BIN	Bubble interest	Dolphin shows interest for the air bubbles [...] and/or follows them to the water surface	Pace D.S., 2000
64	BCN	Bubble contact	Dolphin bites/passes through/pushes the bubbles (derived from the ring rupture) or the ring	Pace D.S., 2000

## PLAY BEHAVIOUR

65	COB	Circle object	<i>Inia</i> begins swimming round the [...] object in wide circles, in other words the object is now included in the swimming circle	Pilleri G., 1980
66	MOB	Mouth object	<i>Inia</i> would hold the handle in his mouth	Pilleri G., 1980
67	ROB	Rub object	The adult male using th brush to make contact with one of his young companions.	Pilleri G., 1980
68	POB	Push object	She would [...] touch it with the tip of her beak, afterwards sending it staggering sideways with a smart blow of the beak, exactly like a golfer propelling the ball	Pilleri G., 1980
69	TOB	Transport object	Carrying a deck tennis ring on or underneath the head, carrying a basin on the head and placing a bucket over the beak can also be defined as accessories play	Pilleri G., 1980
70	SOB	Slap object	She released the ball which bobbed up to the surface	Pilleri G., 1980
71	OOB	Touch object	<i>Inia</i> touches the object for the first time with the tip of its beak (nudging)	Pilleri G., 1980
72	WOB	Throw object	Play with a number of different toys, plastic balls, rings, rubber tubes, brushes rugby balls, thrown above the surface of the water	Renjun L., Gewalt W., Neurohr B. & Winkler A., 1994

### REFERENCES:

- Befkovich V.M., Ivanova E.E., Yefremenkova O.V., Kozarovitsky L.B. & Kharitonov S.P. (1991) Searching and hunting behavior in the bottlenose dolphin (*Tursiops truncatus*) in the Black Sea. In: *Dolphin societies: discoveries and puzzles*, Pryor K. & Norris K.S. (eds.) pp. 38-67. University of California Press: Berkeley
- Best R.C. & da Silva V.M.F. (1989) Amazon River Dolphin, Boto *Inia geoffrensis* (de Blainville, 1877). Handbook of Marine Mammals, Vol. 4.
- Caldwell M.C., Caldwell D.K. & Evans W.E. (1966) Sounds and Behavior of Captive Amazon Freshwater Dolphins, *Inia geoffrensis*. Contribution in Science No.108
- Connor R.C., Wells R.S., Mann J. & Read A.J. (2000) The bottlenose dolphin: Social relationships in a fission-fusion society. In: *Cetacean Societies*, Mann J., Conner R.C., Tyack P.L. & Whitehead H. (eds.) pp. 91-126. University of Chicago Press, Chicago.
- Constantine R., Brunton H. D. & Dennis T. (2004) Dolphin-watching tour boats change bottlenose dolphin (*Tursiops truncatus*) behaviour. *Biological Conservation*, 117, 299-307
- da Silva V.M.F. (2002) Amazon River Dolphin - *Inia geoffrensis*. In: *Encyclopedia of marine mammals* (Perrin W.F., Würsig B., Thewissen JGM, eds.). Academic Press, San Diego, 18-20
- Delfour F. & Aulagnier S. (1997) Bubbleblow in beluga whales (*Delphinapterus leucas*): a play activity? *Behavioural Processes*, 40, 183-186.
- Dudzinski K.M. (1996) Communication and behavior in the Atlantic spotted dolphin (*Stenella frontalis*): Relationships between vocal and behavioral activities. PhD dissertation, Texas A & M University. 215 pp. (Appendix C)
- Dudzinski K.M., Sakai M., Masaki K., Kogi K., Hishii T. & Kurimoto M. (2003) Behavioral observation of bottlenose dolphins towards two dead conspecifics. *Aquatic mammals*, 29.1, 108-116
- Dudzinski, K. M., Thomas, J. A. & Douaze, E. (2002). Communication. In: Perrin, W.F., Würsig, B. & Thewissen, J.G.M. (eds.), *Encyclopedia of Marine Mammals* pp. 248-259. New York, Academic Press.
- Gewalt W. (1989) Orinoco-Freshwater-dolphins (*Inia geoffrensis*) using self-produced air bubble "rings" as toys *Aquatic mammals*, 15.2, 73-79.
- Herzing D.L. & Johnson C.M. (1997) Interspecific interactions between Atlantic spotted dolphins (*Stenella frontalis*) and bottlenose dolphins (*Tursiops truncatus*) in the Bahamas, 1985-1995. *Aquatic Mammals*, 23.2, 85-99.
- Johnson C.M. & Norris, K. S. (1986) Delphinid Social Organization and Social Behavior. In *Dolphin Cognition and Behavior: A Comparative Approach*, R. J. Schusterman, J. A. Thomas and F. G. Wood (eds.), Lawrence Erlbaum Assoc., Hillsdale, NJ pp. 335-346
- Mann J. & Smuts B. (1998) Natal attraction: Allomaternal care and mother-infant separations in wild bottlenose dolphins. *Animal Behavior*, 55, p.1097-1113
- Mann J. & Smuts B. (1999) Behavioral developments in wild bottlenose dolphin newborns (*Tursiops sp.*). Reprinted from: *Behaviour* 136.5. Brill- P.D.B. 9000-2300 PA Leiden. The Netherlands.
- Marten K., Shariff K., Psarakos S. & White D. J. (1996) Ring bubbles of dolphins. *Scientific American* pp. 82-87.
- Martinez D.R. & Klinghammer E. (1978) A partial ethogram of the killer whale (*Orcinus orca L.*) *Carnivore*, 3, 13-27
- McCusker J.S. (1975) Observation on the Amazon Dolphin *Inia Geoffrensis* at the Fort Worth Zoological Park
- Miles J. A. & Herzing D. L. (2003) Underwater analysis of the behavioural development of free-ranging Atlantic spotted dolphin (*Stenella frontalis*) calves (birth to 4 years of age). *Aquatic Mammals*, 29.3, 363-377.
- Muller, M., Boutiere, H., Weaver, A. & Candelon, N. (1998). Ethogram of the bottlenose dolphin (*Tursiops truncatus*) with special reference to solitary and sociable dolphins. *English Translation of Vie Milieu*, 48.2, 89-104
- Nelson D.L. & Lien J. (1994) Behaviour pattern of two captive Atlantic white-sided dolphins, *Lagenorhynchus acutus*. *Aquatic Mammals*, 20.1, 1-10.
- Norris K.S. & Johnson C.M. (1994). Social Behavior. In: The Hawaiian Spinner Dolphin, Norris K.S., Würsig B., Wells R., & Würsig M. (eds.) University of California Press, Berkeley and Los Angeles, pp. 243-286
- Ostman J.S.O. & Folkens P.A. (1996) A vocabulary to describe cetacean behavior. University of California, Santa Cruz pp.26
- Pace D.S. (2000) Fluke-made bubble rings as toys in bottlenose dolphin calves (*Tursiops truncatus*) *Aquatic Mammals*, 26.1, 57-64.
- Pilleri G. (1980). Play behaviour in Platanista and *Inia*. In: Investigation on Cetacea
- Pryor K. (1990) Non-acoustic communication in small cetaceans: glance, touch, position, gesture and bubbles. In: *Sensory Abilities of Cetaceans*. Thomas J. & Kastelein R. (eds.), Plenum Press, New York, pp. 537-544
- Renjun L., Gewalt W., Neurohr B. & Winkler A. (1994) Comparative studies on the behavior of *Inia geoffrensis* and *Lipotes vexillifer* in artificial environments. *Aquatic Mammals*, 20.1, 39-45
- Saayman G.S., Tayler C.K., & Bower D. (1973) Diurnal activity cycles in captive and free ranging Indian Ocean Bottlenose dolphins (*Tursiops aduncus* Ehrenberg) *Behavior*, 44, 212-233
- Samuels & Gifford T. (1997) A quantitative assessment of dominance relations among bottlenose dolphins. *Marine Mammal Science*, 14.1, 70-99
- Shane S.H. (1990) Behavior and ecology of the Bottlenose dolphin at Sanibel Island, Florida. In: *The bottlenose dolphin*, Latherwood S. & Reeves R.R. (eds.) pp. 245-265.
- Slooten E. (1994) Behavior of Hector's Dolphin: classifying behavior by sequence analysis. *Journal of Mammalogy*, 75.4, 956-964
- Sylvestre J.P. (1985) Some observations on the behavior of two Orinoco Dolphins (*Inia geoffrensis humboldtiana*), (Pilleri and Gihl 1977), in captivity, at Duisburg Zoo *Aquatic Mammals*, 11.2, 58-65.
- Tavolga M.C. & Essapian F.S. (1957) The behavior of the bottlenose dolphin, *Tursiops truncatus*: Mating, pregnancy and parturition, mother-infant behavior *Zoologica*, 42, 11-31
- Würsig B. & Würsig M. (1979) Behavior and Ecology of the bottlenose dolphin, *Tursiops truncatus*, in the South Atlantic. U.S. Fishery Bulletin, 77.2, 399-4