

The Behaviour and Trainability of *Sotalia fluviatilis guianensis* in Captivity: A Survey

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Abstract

The results of a survey covering the basic, captive behavioural characteristics and training features of the coastal tucuxi, *Sotalia fluviatilis guianensis*, are presented. The survey results, covering all *Sotalia* presently in captivity, agree with earlier behavioural observations. These small dolphins demonstrate low indices of curiosity, play, manipulative and care-giving behaviour, and their display of leaping and surface behaviour in general is low. Overall, *Sotalia* fell below *Tursiops truncatus* in their mean expression of behaviour within every major behavioural category.

Sotalia was rated overall as harder to train than *Tursiops*, and more reliable in its day-to-day performance of learned behaviours. The ease with which *Sotalia* responds to various cue stimuli for training purposes was comparable to that of *Tursiops*. Although nervous by nature, the coastal tucuxi has demonstrated a captive durability and a reliable trainability; most respondents agreed that the trainable limits of these small dolphins have not yet been challenged. Although similar to other captive odontocetes in individual behavioural categories, the overall behavioural profile of *Sotalia* is dissimilar to that of any other species surveyed to date.

KEY WORDS: *Sotalia*, behaviour, behavioural profile, training/behavioural characteristics.

Introduction

Numerous observational studies have been completed on captive cetaceans. These include a survey by DeFran and Pryor (1980) on the behaviour and trainability of eleven species, some fairly common and others relatively rare in captivity. Respondents in this earlier survey came primarily from North America and Hawaii, with only one representative from Western Europe.

DeFran and Pryor provided persuasive reasons for enlisting the aid of professional trainers in the study of cetacean behaviour, including their length of involvement with dolphins and the necessity of their

'ability to recognize and to interpret correctly the nature and functions of various forms of behaviour (p. 332)'.

The tucuxi, *Sotalia fluviatilis*, is a small South American dolphin whose range includes the freshwater habitat of the Amazon River and the marine coastal waters along Columbia, Venezuela, Surinam and Brazil. Perhaps the smallest of the delphinids, *Sotalia* has been a relatively rare captive species, and due to its fairly inaccessible habitats an infrequently studied one. At present, the tucuxi exists in captivity only in Western Europe.

Sotalia sp. has existed in captivity at three European locations since 1977 (see Fig. 1). Bössenecker (1978) described the capture of these tucuxi from the coast of Columbia, and a previous observational study (Terry, 1983) covered the general behavioural attributes of three individuals from this group at the Antwerp Zoo. Although *Sotalia* has existed in captive US locations in the past (Spotte, 1967; Caldwell & Caldwell, 1970), these instances were short lived and involved the freshwater, riverine variety of the tucuxi, *Sotalia fluviatilis fluviatilis* (Gervais, 1852) from the Amazon River basin. All individuals involved in the present study are of the marine, coastal variety, *Sotalia fluviatilis guianensis* (P. J. van Beneden, 1864). The present survey therefore represents a species not included in the previous study by DeFran and Pryor, and, to the best of the author's knowledge, all *Sotalia* currently alive in captivity.

Methods

This survey on the captive behaviour and trainability of *Sotalia* began in October 1983. Respondents returned questionnaires between December of 1983 and February of 1984 and the results were compiled by the beginning of March 1984. Participants were chosen from various sites in Europe on the basis of (1) their present and past association with *Sotalia*, (2) the length of time actively involved in training the species, and (3) their involvement and time associated with *Tursiops truncatus* as well (see Table 1). The name of each participant, with their associated institution, is given in the acknowledgement section.

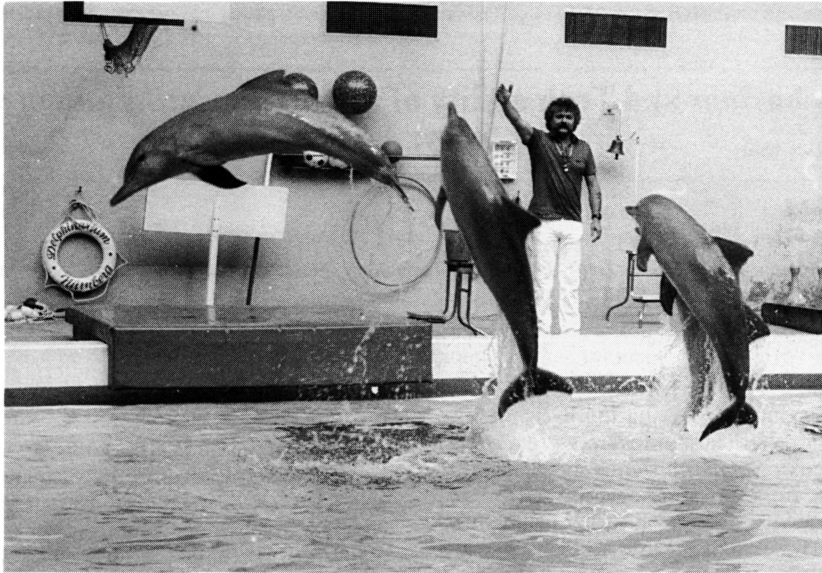


Figure 1. *Sotalia* performing a trained behaviour at the Nürnberg Zoo in West Germany.

Table 1. Normative Data on 8 Survey Respondents^a

Behaviour	Species	
	<i>Sotalia</i> sp.	<i>T. truncatus</i>
Number of Respondents	8	8
Mean Years of Observations ^b	4	9
Mean of Animals Observed ^b	7	39
<i>Training</i>		
Number of Respondents	7	7
Mean Years Worked with Species ^b	5	9
Mean No. Animals Trained ^b	5	12

^a80% of the total of 10 respondents solicited

^bMeans rounded to nearest whole number.

The same format used by DeFran and Pryor (1980) was incorporated into the present study. Major elements are the same in both surveys, including types of behavioural traits, trained behaviours, sensory cues, and rating scales. Since most of the respondents were not fluent in English instructions were given verbally, as well as in written form. The methods for choosing specific behavioural traits and trained behaviours to be surveyed, and reasons for the placement of traits within major behavioural categories, were described by DeFran and Pryor.

Respondents were asked to rate behavioural traits on a scale of 1–4, where 1 = never observed, 2 = rarely observed, 3 = occasionally (or moderately often) observed, and 4 = frequently observed. Ratings for

the trainability survey and ease of response to various cue stimuli, using *Tursiops truncatus* as a model, were on a scale of 1–3, where 1 = trains with greater difficulty than *T. truncatus*, 2 = training difficulty/ease is comparable to that of *T. truncatus*, and 3 = training is easier than for *T. truncatus*. Trained behaviours that were rated by less than four respondents were listed as 'not rated'. *Tursiops*, common in both North American and European dolphinariums, was used as a control for trainability and as a basis of comparing the results of the present survey with the earlier survey. Finally, an overall global score of the tucuxi, in comparison with *Tursiops*, rated trainability and reliability on a 5-point scale ranging from 'much harder to train or much less reliable' (= 1.0) to

'much easier to train or much more reliable' (= 5.0). In addition to the list of behavioural traits and trainability responses, space was included on the survey for additional comments (i.e. species specific behaviours observed but not listed and trained behaviours not included among those rated on the survey). Since *Sotalia* is currently in captivity at only three locations in Europe (comprising a total of eight individual dolphins), several respondents from any one location were rating the same dolphins. The data was studied as a function of individual dolphinariums, and these results showed a low level of variability in responses from separate institutions. Responses from different dolphinariums showed only a slight increase in variability for the two species of dolphins surveyed.

There were a number of ways in which the present survey differed from DeFran and Pryor's survey. The number of individual subjects and respondents represented in the present survey is smaller on the whole than the previous one.

Since surviving *Sotalia* have been in captivity for just over six years, respondents were selected who had a minimum of one year observational/active training contact with the species, and such contact had to be no longer than two years prior to the survey. In addition, at least two years active contact with *Tursiops* was required. Even though minimum requirements were set, the background of participants in the present study was of high quality (see Table 1). The data in the survey results include information from:

1. all but one of the trainers currently working with *Sotalia*,
2. trainers who have worked with the species in the past (including dolphins no longer alive),
3. one trainer/handler who has also observed *Sotalia* in its natural environment, and
4. three trainers who have had continuous contact with the species since its arrival in captivity six years ago.

The institutions of all respondents have *T. truncatus* in captivity as well, and all respondents included in the trainability section had a minimum of two years training contact with *Sotalia*.

Results of the behaviourable survey

The total number of survey respondents (eight out of ten solicited, or 80%) represents approximately sixty percent of the total number of persons in Europe who have had any active contact, even for short periods, with *Sotalia*. The mean number of years working with the species (5) represents 77% of the total years (6.5) that *Sotalia* has been in captivity in Europe. Means from the normative data (Table 1) were skewed (due to the broad background and wide experience among the respondents) only in the case of the number of animals observed under behaviour.

In this instance, *medians* for each species might give a more accurate representation of the data (4 for *Sotalia*, and 22 for *Tursiops*).

The use of *Tursiops truncatus* as a control species for comparing the earlier survey results of DeFran and Pryor with the European respondents in the present study shows a high degree of similarity in the overall rating of behavioural characteristics (see Fig. 2). The close agreement between the two populations of respondents on the captive behaviour of *Tursiops* lends credibility for comparing the behavioural profile of *Sotalia* in the present survey with that of other cetacean species previously surveyed by DeFran and Pryor. The mean ratings within the column of each behavioural category are based on *raw-score* ratings and provide information on the degree to which a given category typifies a species. Data in Table 2 show that the tucuxi falls comparatively low in mean behavioural category ratings for curiosity, manipulation and play, leaping/surface behaviour and care-giving behaviour. These results are in line with previous observations of a limited number of *Sotalia* at the Antwerp Zoo (Terry, 1983). Individual expression does offer exceptions to the rule, however, and in Antwerp trainers noted that the female's behaviour was distinctly different from the males, especially in her more overt attention-seeking displays (a trait common among the *Tursiops* at the same location). The tucuxi scored high marks for affiliative/social and contact behaviour, sexual interactions, and fear, stress and subordination behaviour. Respondents emphasized the temperament and social nature of these small delphinids. They are less expressive than the bottlenose dolphin, bunch together quickly when alarmed, form more of a special group and take a longer time to adapt to captivity than *Tursiops*.

Sotalia was rated higher than *T. truncatus* only in aggression toward other cetacean species. Although the rating difference was not much higher, aggressive interactions between *Sotalia* and *Tursiops* have been observed to be expressive and intense in at least one captive location (Terry, 1984). One respondent also listed aggressive teasing of other cetaceans as a species typical behaviour. Differences were noted between *Tursiops* and *Sotalia* in expression of the following behavioural traits: approaching new objects, opening or lifting gates, inventing games, and tail slaps on the surface of the water. In all of these instances, and indeed in *every* major behavioural category (see Fig. 2) *Sotalia* was rated lower than *Tursiops*.

Results of the trainability survey

The results show a clear trend in the training profile for *Sotalia*: the species is rated as harder than *T. truncatus* but is viewed as more reliable, or consistent,

Table 2. Behavioural Ratings and Profiles for *Sotalia* sp. and *T. truncatus*

	Raw Scores ^a		Ratings ^b	
	<i>Sotalia</i> sp.	<i>T. truncatus</i>	<i>Sotalia</i> sp.	<i>T. truncatus</i>
<i>Affiliative/Social/Contact Behaviours</i>				
Breathing in unison	2.9	3.3	0	+
Leaping in unison	2.5	3.0	0	0
Swimming in pairs (pectoral fin touching)	3.3	3.5	+	+
Forms male/female pair	3.0	3.1	0	+
Strokes other animal	2.9	3.1	0	+
Solicits stroking for human	2.1	3.5	0	+
Mean Rating (× 10)	28	33		
<i>Agression</i>				
Threat posture	3.1	3.6	+	+
Threat sound	2.8	3.4	0	+
Tooth rakes	3.0	3.5	0	+
Harasses new/sick tank mates	1.9	2.0	–	–
Aggressive toward other cetacean species	3.1	3.0	+	0
Threatens to attack other cetaceans	3.0	3.1	0	+
Threatens to attack human	1.0	1.9	–	–
Threatens to attack apparatus	1.2	2.6	–	0
Attacks other cetaceans	2.5	2.6	0	0
Attacks human	1.0	1.6	–	–
Attacks apparatus	1.1	1.8	–	–
Mean Rating (× 10)	22	27		
<i>Curiosity/Manipulations/Play</i>				
Approaches new objects	1.6	3.1	–	+
Manipulates new objects	1.3	2.9	–	0
Opens gates, lifts nets, etc.	1.3	3.5	–	+
Cooperates with other cetaceans	2.1	2.6	0	0
Removes tag, rope, etc. from other cetacean	1.7	2.9	–	0
Invents games	1.7	3.3	–	+
Manipulates noncetacean animals	1.0	3.1	–	+
Mimics sounds	1.0	1.9	–	–
Plays with familiar objects (ball, etc)	2.5	3.8	0	+
Plays chase with cetacean	3.0	3.4	0	+
Other games with cetacean (e.g. 'keep away')	2.4	2.9	0	0
Spy-hop	2.6	3.1	0	+
Mean Rating (× 10)	19	30		
<i>Sexual Behaviour</i>				
Rubs genitals on tank objects	2.3	3.1	0	+
Attempts intercourse with conspecific of other sex	3.6	3.6	+	+
Attempts intercourse with other species of opposite sex	3.1	3.4	+	+
Male attempts intercourse with other sex	3.3	3.6	+	+
Intercourse with conspecific	2.5	2.6	0	0
Intercourse with cetacean of other species	1.8	2.0	–	–
Other sexual behaviour	1.8	2.8	–	0
Mean Rating (× 10)	26	30		
<i>Care Giving</i>				
Assist/protects new tankmate	1.3	2.1	–	0
Supports sick/injured tankmate	1.6	2.5	–	0
Mean Rating (× 10)	15	23		
<i>Fear/Stress/Subordination</i>				
Avoids new objects	4.0	3.4	+	+
High-speed swimming	3.1	3.3	+	+
Chuffing (sharp exhalation)	3.1	3.1	+	+
Bunching (drawing together when alarmed)	3.6	3.8	+	+
Giving distress sound	2.8	3.4	0	+

Table 2. Continued

	Raw Scores ^a		Ratings ^b	
	Sotalia sp.	T. truncatus	Sotalia sp.	T. truncatus
<i>Fear/Stress/Subordination</i> continued				
Shows whites of eyes	2.0	2.6	—	0
Lies passively on tank bottom	2.0	2.8	—	0
Subordinates to other cetacean species	3.0	2.6	0	0
Prostrates across other's rostrum	2.3	2.9	0	0
Turns ventral up if threatened	1.6	1.6	—	—
Other subordinates display	2.3	2.4	0	0
Tail-slaps	1.9	3.5	—	+
Mean Rating (× 10)	26	30		
<i>Leaping and Surface Behaviour</i>				
Breaches (lands flat on side/back)	2.3	3.6	0	+
Porpoises (smooth arching reentry)	2.4	3.6	0	+
Other types of leaps (e.g., spin)	1.6	2.5	—	0
Pectoral slap on water surface	1.4	2.4	—	0
Slaps head on water surface	1.8	2.9	—	0
Mean Rating (× 10)	19	30		

^aAverage rating rounded to the nearest tenth.

^b'—' = rare occurrences of behaviour (mean of 1.2–2.0). '0' = moderate number of occurrences of behaviour (mean of 2.1–3.0). '+' = frequent occurrences of behaviour (mean of 3.1–4.0). The 'Mean Rating' is obtained by summing the raw scores for items and dividing by the number of items rated in that column. Raw scores consist of the average rating (1–4) given by all respondents for that item.

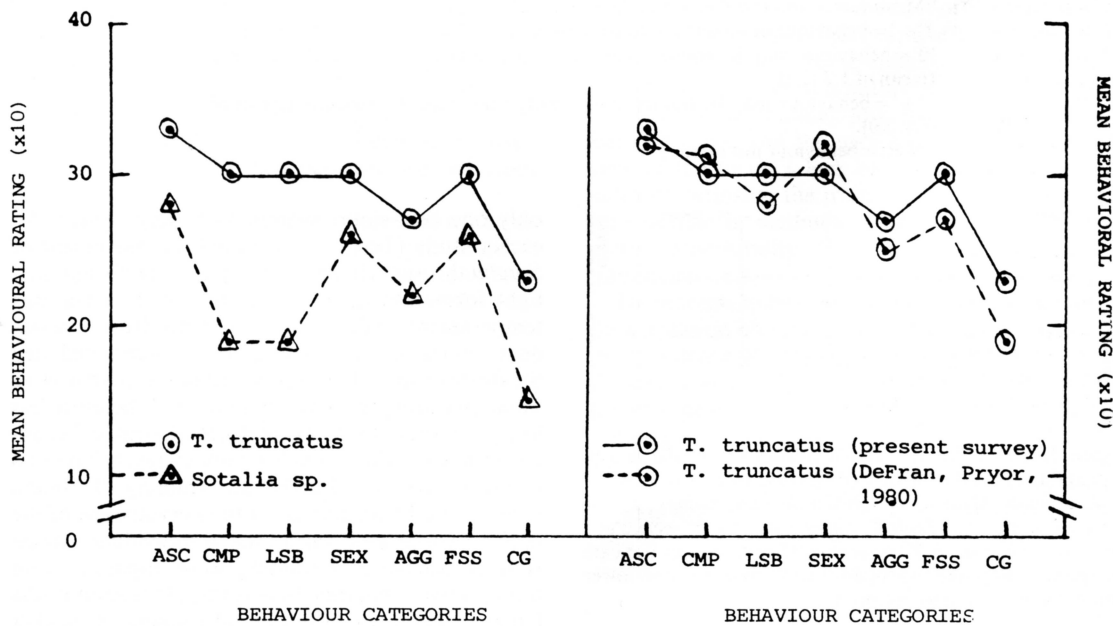


Figure 2. Behavioural profiles from the data of Table 2. The mean behavioural rating scale (ordinate) is as in Table 2, where 10 means the behavioural category was never observed and 40 means it was frequently observed. A/S/C = Affiliative/Social/Contact; C/M/P = Curiosity/Manipulation/Play; L/SB = Leaping/Surface behaviours; SEX = Sexual; AGG = Aggression; F/S/S = Fear/Subordination/Stress; and CG = Care-giving.

Table 3. Comparisons of *Sotalia* sp. with *T. truncatus* on the Ease/Difficulty of Training Various Behaviours

Behaviour	Sotalia sp.	
	Raw Scores ^a	Ratings ^b
Waving/exposing pectoral fin	1.3	—
Tail-wave or -slap	1.6	—
Allowing touching or petting	1.1	—
Swimming through gates	3.0	+
Chains of responses	1.8	0
Manipulating in-water objects	1.1	—
Wearing props, scientific equipment	1.0	—
Wearing blindfolds (eye-cups)	N.R.	N.R.
Vocalizing underwater on command	N.R.	N.R.
Vocalizing in air on command	1.6	—
Retrieving objects	1.6	—
Towing gear or apparatus	1.8	0
Towing or giving trainer ride	N.R.	N.R.
Simple leaps (e.g. porpoising)	1.6	—
Breach	1.3	—
Complex leaps (e.g., sommersault)	1.0	—
Leaping over obstacles	1.6	—
Unison performance	1.9	0
Breaching or slide out	N.R.	N.R.
Entering stretcher on command	N.R.	N.R.
Open-ocean work (any type)	N.R.	N.R.
Total Behaviours Rated	15	
Mean Rating (× 10)	16	

^aMean raw scores rounded off to the nearest decimal

^b'—' = behaviour more difficult to train than in *T. truncatus* (mean of 1.0–1.6).

'0' = behaviour may be trained with same ease/difficulty as with *T. truncatus* (mean of 1.7–2.3).

'+' = behaviour may be trained more easily than with *T. truncatus* (mean of 2.4–3.0).

N.R. = behaviour not rated.

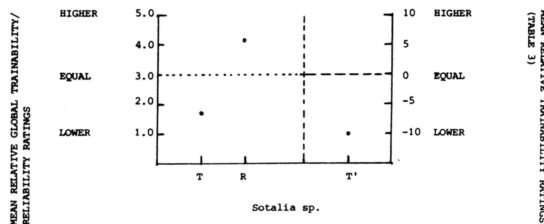


Figure 3. Left ordinate: Global ratings of *Sotalia* sp. on trainability (T) and reliability (R) relative to *T. truncatus*. Right ordinate: Mean transformed trainability ratings (T') for specific behaviours of Table 3. 'Equal' indicates the species was rated as equivalent to *T. truncatus*. Higher ratings indicate the species was judged as superior to *T. truncatus* and lower rating that it was judged as inferior.

in day-to-day performance of trained behaviours (see Fig. 3). On all but two trained behaviours, *Sotalia* was rated harder to train than *Tursiops* (see Table 3). *Sotalia* was rated as easier to train than *Tursiops* on

only one behaviour: swimming through gates. An earlier study (Terry, 1983) noted the movement of *Sotalia* through channels and gates quickly and in a tight formation as an expression of their nervous temperament. Additional comments from respondents on training characteristics of *Sotalia* included the observations that *Sotalia* are not as inventive as *Tursiops* during training exercises, and therefore less likely to spontaneously perform desirable behaviours; they also do not readily copy trained behaviours from one another. Further the training of *Sotalia* seems to be handicapped by the nervousness of the species. Some wide variations in individual expression of behavioural training were apparent from questionnaire remarks. In Antwerp, for example, the female *Sotalia* was listed by all trainers as quicker to learn and easier to train than the males; as one respondent put it, she was clearly the 'cock of the walk' among the three individual dolphins.

Survey responses on how easily *Sotalia* learns to use sensory signals as compared to *T. truncatus*

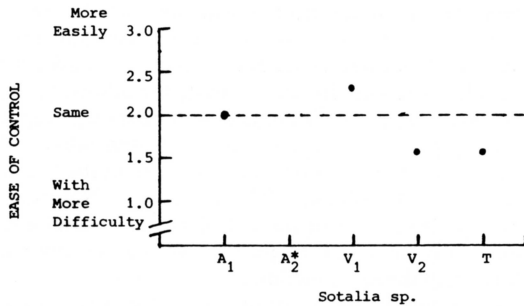


Figure 4. Comparative ease of establishing control with different types of cues for *Sotalia* sp. Comparisons are in reference to *T. truncatus* (dashed line). A₁ = Sound in Air; A₂ = Sound Underwater (*not rated); V₁ = Visual Signal-Stationary; V₂ = Visual Signal-Moving; T = Touch Signal.

showed similar scores for the two species (see Fig. 4). The use of sound in air, in fact, was exactly the same in ease of control as for *Tursiops*, and the use of a stationary visual signal was rated higher, or easier for control, than with *Tursiops*. This may seem a little surprising in view of the fact that original assumptions were made, based upon the limited clarity of the turbid coastal waters in their natural environment (Bössenecker, 1978) and an eye which is less expressive than that of *Tursiops*, that the vision of *Sotalia* was much more limited than that of the bottlenosed dolphin. Structurally, the eye of *Sotalia* seems to be similar to that of *Tursiops*, (Drahl, 1985), and behavioural observations of the tucuxi's adaptation to captivity (Terry, 1983) indicate a good functional use of the eye. Response to underwater sound cues was not rated—unlike many captive locations in North America, the use of sound cues underwater during training and for show performances in Europe is relatively rare.

Behaviours that *Sotalia* have been trained to do that were not on the survey list include: jumping over an illuminated, transparent perspex hurdle in total darkness; a whole body slide out; tailwalks; and playing 'football' (stroking balls out of the water with the flukes). One respondent noticed that the tucuxi could be caught with great ease soon after arrival in captivity by placing a small, hooped fishing net over the snout as individuals swam past. The dolphin would immediately become passive and orient its body in a vertical position, allowing itself to be pulled to the side of the pool with the handle of the fishing net. This later caused problems in the training for plastic ring retrieval because the same behaviour occurred as soon as the dolphins put their snouts through the rings.

Learning in *Sotalia*

Although beyond the scope of the present study in the strictest sense, a few general comments can be made

about the nature of the coastal tucuxi's cognitive characteristics. Pryor (1973) gave a broad overview of the learning characteristics of cetaceans, and Herman (1980) presented, in addition to a review of the current literature on the subject, a more complete in-depth look at the cognitive parameters of dolphins. *Sotalia* seems to diverge significantly from *Tursiops*, and other familiar captive species, in learning characteristics.

Specifically, these small dolphins show low indices for specialized cognitive indicators often associated with dolphin intelligence. Of the major, unique learning characteristics listed by Pryor (1973) as indicators of higher intelligence in cetaceans (including learning by observation, single-trial learning, competency motivation and cooperative behaviour), all seem to be expressed to only a small degree, if at all, by *Sotalia* during the learning process. The present survey, unlike the earlier study by DeFran and Pryor (1980), did not include a section on the questionnaire to rate observational learning, or the imitation of other dolphins' behaviour. Subjective impressions among trainers are, however, that this type of learning occurs to a lesser degree in *Sotalia* than in *Tursiops*. The tucuxi has, however, demonstrated good and reliable memory functions in the auditory, visual, and spatial domains; trained behaviours have quickly and easily been recalled by the species after lapses in performance of up to three months.

It is clear that the temperament of *Sotalia* plays a major role in learning under captive conditions. Any trainer working with these animals must constantly be aware of their nervous nature, wariness of novelty or changes in routine, low frustration levels in learning tasks, and the need to proceed slowly. In view of the tucuxi's lack of innovation and a low index of curiosity, the trainer must, in addition, be very flexible in methods of approach and assume more responsibility for innovation during the training process.

There seems to be some evidence for an increase in the utilization of visual information (and a decrease in dependence upon auditory information) over time as *Sotalia* adapts to captivity. The implications of this change must be taken into consideration during training when various cue stimuli are selected. In addition, there is an apparent decrease in sonar use by *Sotalia* over time in captivity, more so on a comparable basis than for *Tursiops*. This trend would be critical to keep in mind the design of any bio-acoustic experiments that may be initiated with the species.

Discussion and Conclusions

The results of the present survey identify numerous areas where the basic behavioural traits of the coastal tucuxi both overlap with and diverge from the behavioural profiles of other dolphin species.

An earlier description by Pryor (1973) of the temperament of members of the Genus *Stenella* is remarkably similar to the present survey results for individuals of the Genus *Sotalia*.

The coastal tucuxi can now be compared with other captive delphinid species for trainability and behavioural responses. Such comparisons may shed some light on the relationships between species that share similar ecological correlates.

The trainability of *Sotalia* is distinctly different from that of *Tursiops* in several areas. In view of these differences, comparisons especially need to be made between the coastal tucuxi and other small coastal delphinids.

Overall, the background experience of the respondents and their contact with the species (see Table 1) was very similar in the two surveys. A cluster analysis of species' behavioural profiles, present in the previous survey, could not be included in a survey of only two dolphin species. It would nevertheless be interesting, and perhaps revealing, to compare *Sotalia* via the cluster analysis technique with other captive species now surveyed. Results from the DeFran and Pryor (1980) study show especially interesting correlates between dolphin species in the social and ecological (specifically feeding ecology) domains of behaviour. The data in the present survey may hold important future implications for comparisons between the river and neritic populations of *Sotalia* sp. The taxonomy of *Sotalia* has been in flux over the last several decades. It is one of several odontocete species, including the Irrawaddy dolphin (*Orcaella*) and the Finless Porpoise (*Neophocoena*), that seem to have both freshwater and marine populations. The data presented might serve as a basis for future comparisons of the coastal tucuxi in the wild, and possibly with any future captive riverine tucuxi.

A difficult aspect of the task requested of the respondents was to generalize behavioural ratings over a period of time, that is, find an 'average' for each behaviour observed over the entire time they have had contact with the species, and not on a day-to-day basis. Trainers seemed keenly aware of this problem. One respondent commented on the factors that may affect captive behaviour, including: time in captivity; time the dolphin has been undergoing training; the temperament of the handler/trainer; the quality of the water (high or low combined chlorine, high or low pH, salinity, visibility, etc.). Another respondent also commented on the natural bias, usually a negative one, that trainers may have in rating a species such as *Sotalia* that is new to captivity.

With most captive species, gradual but continuous changes in behaviour occur during their stay in captivity. Some (and perhaps most) of the *Sotalia* in the current survey have matured in captivity. Effects of this factor alone might have a marked impact on

their sexual and aggressive behaviour. In Antwerp, aspects of the overall nature of *Sotalia* that have altered somewhat since their arrival in captivity include a decrease in nervousness, the allowing and seeking of more tactile contact with humans, a slight loosening of their social bonding, greater individual expression in behaviour and a decrease in the use of their sonar (De Block, 1982; Terry, 1983). Nevertheless, the behaviour of the tucuxi is still distinct and noticeably different from that of the bottlenose dolphin in the same facilities.

Although the results of the present survey were in agreement with a previous study of the species (Terry, 1983), there were several areas of slight disagreement. From the earlier observations of *Sotalia* at the Antwerp Zoo, the following behavioural survey ratings would appear to be too high for the species: (1) lies on the bottom of the tank, (2) invents games; (3) plays with familiar objects, (4) other games, and (5) breaches. In all of these instances, the display of the behaviour was either absent or extremely rare. Perhaps there was a misunderstanding about the definition of these traits (which is very possible), a variety of interpretations of them on the part of respondents, or the *Sotalia* in Antwerp are distinctly different in their expression of these behaviours from *Sotalia* at other locations.

The results of the present survey allow a comparison of the behaviour and trainability of *Sotalia* with other captive cetacean species. Information provided can aid in future efforts to adapt this species to captive environments, and to their healthy, long term maintenance. At the same time, the present data may contribute to a better understanding of *Sotalia* and serve as a basis for future studies on this small dolphin in its natural environment.

The arguments for increased efforts to study the biology of dolphins in their natural environments are currently persuasive and well-founded. At the same time, however, many of the most fundamental behaviours, easily observed in captivity, are either difficult or logistically impossible to study in the wild. In addition, monetary and geographic limitations realistically preclude observational studies on a number of species in their normal environments. For the present, at least, the opportunities afforded by captive environments for increasing our knowledge of cetacean biology should not be overlooked.

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