

## Behavioural observations of bottlenose dolphins towards two dead conspecifics

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### Abstract

Two different dead bottlenose dolphins were observed in separate years with attending male bottlenose dolphins. In 2000, an adult female bottlenose dolphin body was identified ~150 m from shore in ~8 m depth with two attendant adult male bottlenose dolphins. These males were sighted in proximity with the carcass for two days. In 2001, a sub-adult male bottlenose dolphin was observed ~75 m from shore in ~6 m depth with more than two dozen attendant sub-adult and adult male dolphins and two adult female bottlenose dolphins. Attendant dolphins approached the dead male body and engaged in inquisitive behaviours (e.g., echolocation, head-scanning, nudging, Dudzinski, 1998) at the genital region and chest repeatedly. After 17 min of initial observation, attendant males exhibited erections when positioned within 0.5 m of the carcass. Documented behaviours of attendant dolphins in 2000 correspond with mate-guarding activity previously reported for bottlenose dolphins. Several alternative explanations (e.g., dominance, competition) for behaviours recorded during attendance of the sub-adult male carcass are discussed.

Key words: bottlenose dolphins, *Tursiops aduncus*, dead dolphins, mate-guarding, competitive behaviour, emotional intelligence, referential pointing

### Introduction

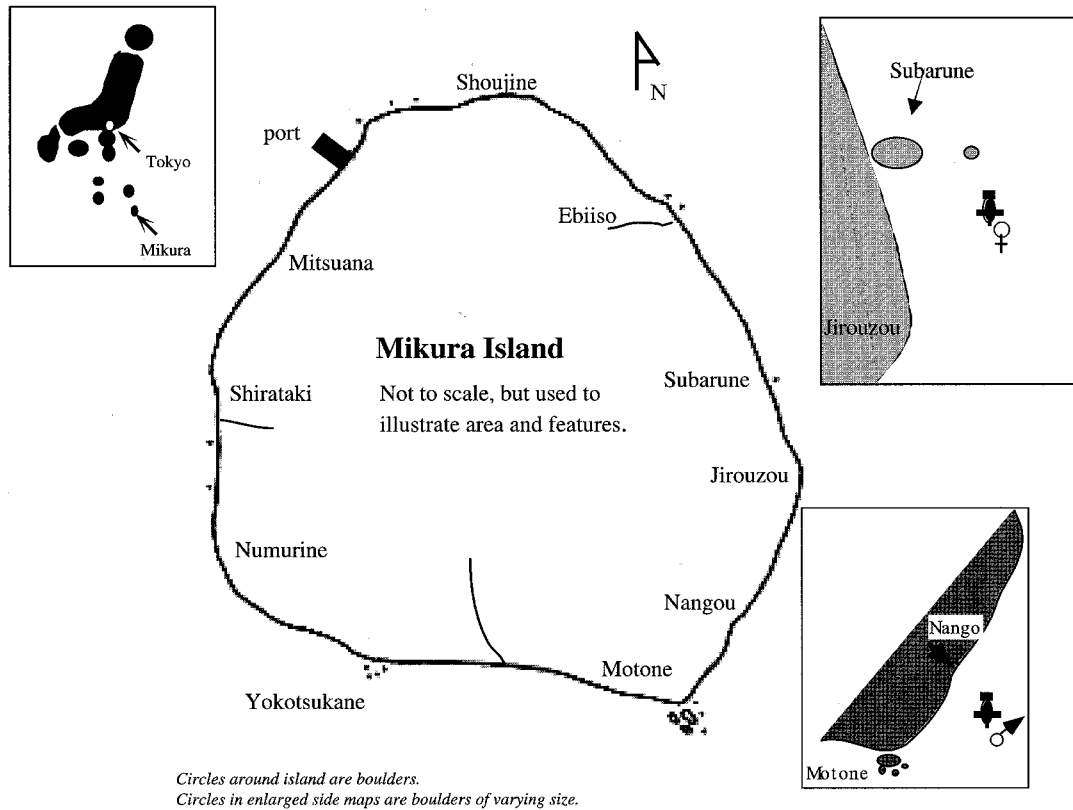
Dolphin behaviours are sometimes witnessed that are at first difficult to classify or understand (e.g., sponge carrying by bottlenose dolphins; Smolker *et al.*, 1997). This paper describes the behaviour of sub-adult and adult bottlenose dolphins (*Tursiops aduncus*) in relation to two different dead dolphin

bodies. The first observation, in May 2000, involved a dead adult female bottlenose dolphin with two attending, adult male bottlenose dolphins. All three dolphins were known from previous observations. The second observation, in July 2001, involved an unidentified, dead sub-adult male bottlenose dolphin and several live attendants—two adult female and at least 20 attending male bottlenose dolphins ranging from sub-adult to adult. Most, but not all, of these attending dolphins were identified. Only during the second observation was the dead dolphin's body recovered and necropsied. Possible reasons for the attending males' behaviour during both observations are presented and discussed.

### Materials and Methods

A study population of approximately 170 bottlenose dolphins is routinely observed and photographed from 2–300 m along the coastline of Mikura Island, Tokyo, Japan (Fig. 1). Since 1994, the Mikura Iruka Kyoukai (M.I.K.), the International Cetacean Education & Research Center Japan (I.C.E.R.C.), and the Dolphin Communication Project (D.C.P.) have recorded dolphin behaviour and sounds under water as part of a longitudinal study. The M.I.K. and I.C.E.R.C. document individual dolphins, their behaviour, and interactions with video cameras during each summer field season (~2 months each). A photographic catalogue of approximately 170 individual dolphins has been updated annually by members of M.I.K. and I.C.E.R.C. since 1994. Gender was determined by direct observation of the genital slit: females with two mammary slits and one external genital/anal slit; males with separation between anal and genital slits or an erect penis.

Data for the current paper were gathered from dolphin-swim tour boats with researchers collecting



**Figure 1.** Location of each dead dolphin along the eastern (observation no. 1) and southeastern (observation no. 2) sides of Mikura Island, Japan. Mikura Island lies approximately 180 km south of Tokyo and is 17 km in circumference. The coast and near shore area are strewn with boulders of varying size. Deeper fish-abundant waters are nearby. Figure is not drawn to scale. Stippling indicates land in enlarged views. Small solid circles are rock formations.

observational data during swims. Tour boats were ~8 m long with a half meter draft. Video data from both observations (in 2000 and 2001) were analysed following an all-occurrence protocol for documenting dolphin behaviours (Mann, 1999).

Two different observations of dead bottlenose dolphin bodies along the coast of Mikura Island, Japan were made: the first was a dead adult female and the second was a dead sub-adult male. Video records were gathered during each observation. Video sequences were analysed for dolphin behavioural activity towards the dead bodies as well as towards other attending individuals. Event and behaviour chronologies are summarized in Tables 1 and 2 (observation no. 1 and no. 2, respectively). Only for the second observation was the dead body retrieved and cause of death determined.

## Results

### Observation no. 1

On 6 May 2000 at about 1300 h, two dolphin watching/swim tour boats (*Koueki-maru* and *Daihachisouei-maru*) arrived just south of Subarune (33°52.409'N 139°38.012'E, Fig. 1) after sighting two dolphin groups (one group was north of

Subarune and one south, ~15 dolphins each). From surface observations, both dolphin groups appeared to be resting (definition consistent with Shane, 1990). Soon after swimmers entered the water, a dead, identified adult female (no. 070) was found on a boulder/sand substrate in waters with a depth of 8 m, ~150 m from shore (Fig. 2a). Two identified adult males (no. 173 & no. 182) remained with the body, surfacing in alternating patterns for a single respiration (Table 1). (We do not mean to imply that the dolphins coordinated their respiration behaviour. Simply, during our observation periods, the dolphins alternated their swims to the surface.)

A third boat (*Umitonchu-maru*) arrived approximately at 1400 h, carrying three M.I.K. members. Between 1300 and 1400 h, three swimmers conducted in-water observations of the dead animal and its 'attendants' (Table 1). The carcass was loosely wedged between two boulders (~1–2 m in size), and lying on black sand. The body was swaying slightly in the bottom current. Video data of behaviours (i.e., no acoustic recordings were made) were gathered during each observation period, resulting in 11 min of video from two days. After approximately 1.5 h of observation, all three boats left the area, while the dolphins remained.

**Table 1.** A chronology of the behaviours of two adult male bottlenose dolphins' attention to a dead female bottlenose dolphin at Mikura Island, Japan, on 6 and 7 May 2000.

Date & Time	Description of Activity
6 May 2000, ~1300 h	Initial observation of 2 resting dolphin groups (~15 dolphins each). Dolphin carcass observed, identified as adult female (no. 70). 2 adult male dolphins (no. 173 & no. 182) with carcass. Both identified males surfaced in alternating patterns for a single respiration (though we do not imply coordination in behaviour). Each male dolphin surfaced in a nearly vertical position, breathed, and then assumed a near-vertical descent, returning to carcass. Carcass retrieval attempted. Attending males assumed aggressive actions (e.g., S-postures, jaw claps; Östman, 1993) at swimmers. The males nudged and pushed at the carcass with their rostra, pectoral fins & bodies, & swam belly-to-belly to carcass after the bottom current shifted her into a ventrum-up position.
6 May 2000, ~1400 h	Third boat with M.I.K. researchers arrives, begin observations. The attending males continue to approach carcass. Nearing carcass, male head-scanned (A dolphin moves its head from side to side, usually emitting clicks or click trains, Dudzinski, 1998) and at times touched the carcass with its rostrum. The attending males pushed the body with their flippers and pulled at the carcass flippers with their rostra. One attending adult approached carcass (when in a ventrum-up position) and engaged in a belly-to-belly rub. These behaviours were observed repeatedly.
6 May 2000, ~1600 h	Only the same 2 males present. If swimmers approached carcass too closely, the 2 males positioned selves on either side of carcass in 'S' postures. Both males were oriented above, but in same horizontal position as, carcass, except the carcass was ventrum-up and males were ventrum-down.
7 May 2000, 0625 h	The same 2 males still present and continue the previously observed behaviours. During 2 h, the males' behaviour did not vary from that reported above.

Later (~1600 h), one boat (*Koueki-maru*) with three M.I.K. researchers returned in a second attempt to collect the carcass. However, the same two males were present, apparently continuing their vigil. No other dolphins were observed. After 20 min of unsuccessful attempts to approach the carcass, and with fading light, the boat returned to port.

On 7 May 2000 at 0625 h, the *Koueki-maru* returned to the observation site. The same two males were present and continued the previously observed behaviours during the subsequent observation period (Fig. 2b). Observations from the surface and under water by researchers continued for approximately 2 h. Because our observations were not continuous, it is not possible to confirm that the attending males remained with the body for the entire time (two days). Weather conditions worsened later on 7 May such that no boats (i.e., fishing or dolphin-watching) left port. Thus, no observations of the dead female or attending companions were possible on this afternoon. It is notable that at no time during our observations were penile erections observed.

On 8 May 2000 (0900 h), five members of the M.I.K. team returned to Subaru to again attempt to recover the carcass or at least gather a DNA sample for analysis. No dolphins were observed from the surface; no carcass was observed. The five M.I.K. members conducted a systematic

(300 m × 100 m) search of the location and surrounding area for approximately 2.5 h. No carcass was found and no dolphins were observed from the surface or under water during this search. It is likely that the sea conditions of the previous day moved the body from between the boulders, after which the body may have drifted to deeper water and sunk.

#### *Observation no. 2*

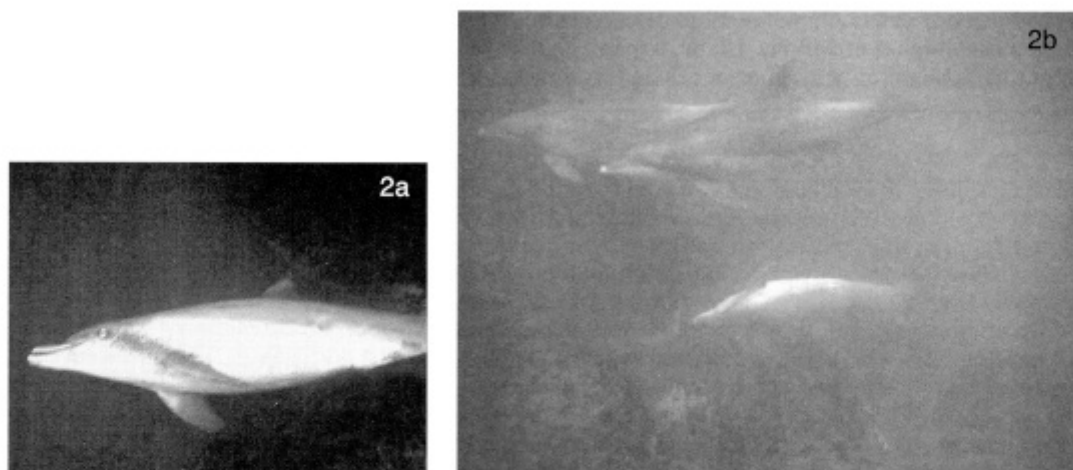
At 0945 h on 20 July 2001, a dead sub-adult dolphin body, later confirmed as a male, was observed with more than 20 attending bottlenose dolphins. All identified attendants (20 confirmed identifications), except two, were male and ranged in age from calf (n=1) to sub-adult (n=16) to adult (n=4). One pregnant adult female (no. 314), often seen with sub-adult male groups, and one other adult female (no. 103) with a one-year-old calf (without recognizable scars) were observed as attendants. These dolphins were observed ~75 m offshore from Nango (33°51.24'N 139°37.75'E, Fig. 1), the south-eastern edge of Mikura Island. As with observation no. 1, the initial sighting of the carcass was made from a dolphin-watching vessel (*Koueki-maru*) during a swim-with-dolphins trip. The carcass was in ~6 m depth with underwater visibility approximately 12 m (Fig. 3a). The dead male bottlenose dolphin was wedged between boulders lying with most of its ventral surface up; the body was

**Table 2.** A chronology of behaviours of ~19 males, two adult females, and one calf bottlenose dolphins' attention to a dead male bottlenose dolphin at Mikura Island, Japan, 20 July 2001. Observations of attendant dolphins were roughly divided into four parts based on variations in behaviours directed toward carcass. All observations made on a single day.

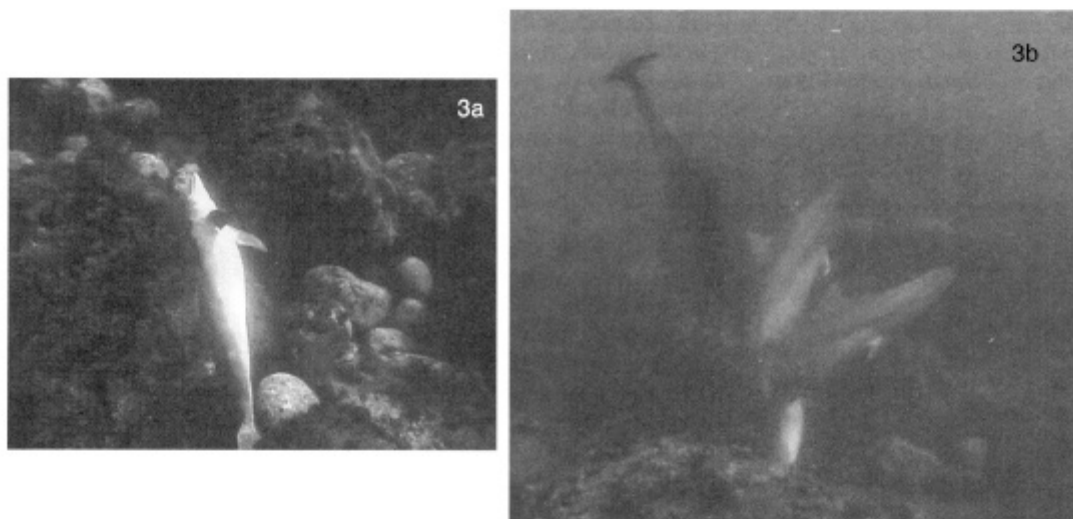
Time	Part	Description of Activity
0945 h–1002 h	1	~15 dolphins within visual range of dead body (~15 m diameter, body as center).
	<i>Pre-erection behavior</i>	1–6 dolphins approach body: vertical & head down. When 1 or more dolphins at carcass, others mill slowly above body, between camera & body. All approaches include echolocation, head-scanning. Loud pops, whines & intense whistles. Often whistling dolphins emit a bubble stream. At body, echolocating, males shake their head & rostrum in vertical plane (up & down). Males occasionally whip tails at peers. Attendant males increase fast circle swims, 'postures' near carcass.
0958:28–34 h	<i>1st physical contact</i>	1 male dolphin positioned with melon touching carcass belly. Echolocating, pushes body with its melon & rostrum. Attendants move head up & down. All dolphins move briefly away from carcass.
0958:48 h	<i>Resumption of activity</i>	6–8 dolphins in tight, parallel formation, swim along bottom, slowly approach body from its dorsal side. 2 dolphins stop: 1 at chest, 1 at genital region. Both echolocate. This activity continues with 2 dolphins alternating with others at body.
1002 h–1016 h	2	The same behaviours as described in part 1 are observed throughout part 2, with the exception that all males at carcass now exhibit erections. Attendant males primarily direct attention at chest & genital area. Level & sound type changes: rate, intensity decreases for echolocation, whistles. Erect males chase others away. Identity of males at body fluctuates. During respiration, attendants swim directly to surface, porpoise to breathe, and return to carcass.
1011:00 h	<i>2nd physical contact</i>	1 male dolphin rubs left side to right, mid-lateral of carcass. Second male dolphin rubs leading edge of pectoral fins to body's right flipper. Duration of about ~1 min.
1012 h		Fewer dolphins within visual range of carcass (~6). Dolphins routinely inspect genital & chest area on body. End these observations at 1016 h.
1224 h–1229 h	3	Same behavior as in parts 1, 2. ~8 dolphins push for access to carcass. Identities vary from morning, no females. All vertical, head down. Not every male is erect: only when at body & then only ~50% of attendants.
1225:58 h	<i>3rd physical contact</i>	1 male dolphin nudges, pushes carcass with its rostrum at body's genital area. Body is moved back & forth 2 to 3 times.
1226:15 h		Four attendants at carcass. 1 dolphin emits a bubble cloud. Sounds include clicks, whines, & whistles.
1230 h–1234 h	4	A researcher (TH) approaches body with line, is approached by one dolphin. Two dolphins echolocate at body, vertical. No erections.
1231:37 h	<i>4th physical contact</i>	Two dolphins with rostra at body's chest. They echolocate & touch, push body. carcass' skin trembles. Third dolphin approaches, investigates genital area with its rostrum.
1231:57 h	<i>Retrieval of body</i>	Line attached to carcass' tail stock. After 1 min, body at boat with 6–8 dolphins near.
1234:35 h	<i>Retrieval of body</i>	Body on boat & out of water. Dolphins mill in area.

positioned partially on its left side. A ~1–2 m boulder was on the dorsal side of the carcass while smaller boulders (<0.5 m across each) bordered the remainder of the body. Behaviour of attending dolphins was video documented for more than 42 min ceasing after the body was removed to the *Kouekimaru*. Observations were conducted in two sessions from 0945 h to 1016 h and from 1224 h to 1235 h at which time the body was removed to the boat (Table 2). Identifications of attendant

dolphins varied between morning and early afternoon sessions; both adult females and the calf were seen in the morning only. Dolphin no. 314 approached the carcass while dolphin no. 103 and her calf did not, but rather remained briefly on the periphery of the attendant group. Video documentation of the carcass continued after placement on the boat; however, identification could not be confirmed because the body lacked reliably re-identifiable scars.



**Figure 2.** (a) The dead female bottlenose dolphin from observation no. 1 lies in ~8 m depth ~150 m from shore. She lies on black sand between large (~2–3 m) boulders. (b) Two adult males remained with the carcass from observation no. 1.



**Figure 3.** (a) The dead sub-adult male dolphin from observation no. 2 in ~6 m depth ~75 m from shore. He lies on a patch of black sand, ventral side up. (b) Sub-adult male attendant dolphins posturing at carcass with penile erections.

More than a dozen male dolphins milled over the carcass in tight formation (Table 2). Often a few dolphins seemed to place themselves between the camera, human swimmers, and the body. On several occasions, as a researcher (swimmer) approached the carcass within 2 m, one to three dolphins postured aggressively, intercepted the swimmer, and approached the camera, although aggressive behaviours were not directed at swimmer or camera (Table 2). The attending males 'postured' toward one another often 'kicking' their flukes at nearby conspecifics while vertically positioned over the carcass. During the first 17 min of observation (Part 1, Table 2), no penile erections were documented from any attending males; these males echolocated and head-scanned the carcass from its rostrum to the anterior

insertion of the flukes with the peduncle. When at the carcass, the attending males were usually vertical with heads and rostra down. Penile erections from attending males were observed during the last 14 min of the first session of observations, but only when within 1 m of the carcass (Fig. 3b).

Although the attending male dolphins nudged and pushed at the carcass with their rostra and melons, relatively few observations of affiliative physical contact were observed (Table 2). In general, the attending males appeared agitated during the initial set of observations, often shaking their heads and rostra at the carcass while echolocating, head-scanning, and whistling. Loud pops, whines, and squawks also were heard during the first observation session.

Observations of the attending dolphins' behaviour during part 3 of the event chronology indicated less agitation directed at the body. The attending dolphins directed inquisitive actions, including nudges, echolocation, and investigative behaviours toward the body's genital region and chest (specifically the region between the carcass' pectoral fins). More than six male dolphins mobbed the carcass on several occasions (Table 2).

At ~1230 h, one of us (TH) approached the carcass with a line for retrieval. The first attempt at retrieval failed due to a slipped knot. On the second approach (after 2 min), a line was attached just anterior to the insertion of the flukes with the peduncle and the carcass was retrieved (Table 2, part 4). At least six male bottlenose dolphins approached the carcass as it was raised; these dolphins swam circles among the observers and around the body, but never postured aggressively. After retrieval, the attendants milled about the boat before the latter returned to port.

Researchers from Mie University (Yoshioka and Kogi), the National Museum of Science (Tajima and Yamada), and M.I.K. (Hishi) performed the necropsy. Cause of death was attributed to drowning; the lungs were filled with water. The stomach contents contained primarily un-metabolized flying fish (*Isistius* sp.) and there was blood congestion in various locations around the body, suggesting panic during death (Tajima, pers. comm.).

As an interesting side note, the dead sub-adult male dolphin was previously observed on 2 July 2001 in the company of three other sub-adult males (Sakai, unpub. data). Only this sub-adult male of this subgroup remained unidentified within the study population because he lacked re-identifiable scars from previous years (M.I.K., unpub. data). It should be noted that during 2001 he possessed marks to warrant inclusion in the population catalogue. During the second observation, none of the dead dolphin's companions from 2 July 2001 was identified as an attendant.

### Discussion

Two different dead dolphin carcasses were observed and the behaviour of live attendants documented on two separate occasions. For the first carcass, according to records from the Mikura Iruka Kenkyukai during the 1998 and 1999 field seasons, one of the males (no. 182) was never observed with the dead female (no. 070), while the second male (no. 173) was recorded with this female on only one day (20 August 1999, M.I.K. unpub. data). These data suggest a relatively low association between these adult dolphins, indicating that these males likely were not familiar with the dead female. For

the second carcass, the dead dolphin had new scars and marks during this season (2001) only that would provide reliable re-identification. Thus, data related to associations between this carcass when living and others are not available. It is possible the dead male dolphin had been a member of a pair or triplet coalition; in fact, the dead dolphin was seen just 18 days prior to its death with three other sub-adult male dolphins. In Monkey Mia, Australia (Connor *et al.*, 1992; Connor *et al.*, 1999) and Sarasota Bay, Florida (Wells *et al.*, 1987), male bottlenose dolphins have been observed to form lifetime alliances with peers. These bonds are expressed as high coefficients of association between members of each pair with males often forming coalitions to herd females during the breeding/calving season (Connor *et al.*, 1992; Connor *et al.*, 1996).

### Epimeletic behaviour

Specific examples of epimeletic behaviour in both captive and free-ranging dolphins, with potential functional explanations, have been detailed in current literature (e.g., Cockcroft & Sauer, 1990; Connor & Smolker, 1990; Smith & Sleno, 1986; Kilborn, 1994; Santos *et al.*, 2000). According to Caldwell & Caldwell (1966), epimeletic behaviour is directed toward young (nurturant) or toward individuals in distress (succorant), usually by other adults. Bonds and relationships formed within large, socially complex communities are likely supported by reciprocal altruism (Connor & Norris, 1982). Dolphins live within structured schools that contribute to the development and maintenance of complex social lives (Norris & Schilt, 1988). Within such societies, epimeletic behaviour could be considered an adaptive strategy for survival of genetically related individuals. Both observations described in this paper; however, are not consistent with nurturant behaviour defined and reported previously.

As defined by Caldwell & Caldwell (1966), succorant behaviour usually is directed towards an ill or injured peer, suggesting that dolphins are capable of identifying distress in conspecifics. It is possible that the attentive individual(s) are reacting instinctively; i.e., dolphins are mammals and air-breathers. Our observations regarding the behaviour of the attending dolphins do not support succorant behaviour (for either observation) because they did not express assistance behaviours. Additionally, for the second carcass observation, the attendants directed investigative behaviours (e.g., echolocation, head-scanning) at the genital area and chest of the dead carcass. Often, these males exhibited penile erections when investigating the body. One would not expect socio/sexual behaviours to be associated with epimeletic behaviour.

### *Dominance and competitive behaviour*

During the second carcass observation, the attending males, while vertical and investigating the carcass with their rostrum and echolocation, often whipped their tails at peers. The fluke and peduncle movements resemble the actions of bottom grubbing in dolphins in the Bahamas (Dudzinski, 1998; Rossbach & Herzing, 1997) and the behaviour of dolphins engaged in 'kerplunking' in Monkey Mia, Australia (Connor *et al.*, 2000). Contrary to the 'kerplunking' dolphins reported by Connor *et al.*, the bottlenose dolphins at Mikura Island were not in shallow water such that their flukes were above the water; they were in  $\sim 6$  m depth. The similarity in these movements may have been coincidental. While investigating the dead body, the attendant dolphins remained vertical at the carcass for an average of  $\geq 30$  s. Flexing and circling of the tail and peduncle could have been required to retain position. Still, several of the 'tail whips' we observed seemed aggressive and were performed with a second dolphin within 1 m. Tail slaps and 'postures' are accepted examples of aggression among dolphins (Östman, 1991; Dudzinski, 1998). Whether these actions were aggressive or simply 'signs' of aggression is inconclusive. If the latter, it is possible that the attendant males were communicating with one another in reference to the carcass.

Pointing is a gesture that indicates reference between individuals and objects: dolphins both understand pointing gestures from humans (Herman *et al.*, 1999) and engage in spontaneous pointing with peers in the captive setting (Xitco *et al.*, 2001). These data suggest that dolphins understand referential gestures and might use them when communicating intra-specifically in the wild. Dolphins in the wild rarely encounter stationary objects and thus, directed pointing is not likely readily observed; dolphins might use echolocation as a directed beam for active pointing. However, data on this idea are difficult to gather from free-ranging dolphins with respect to context because of the inherent difficulties of capturing the high frequency echolocation clicks when off axis (Au, 1993). The attendant dolphins' behaviour with respect to the carcass is strikingly similar to actions described by Xitco *et al.* (2001) for dolphins pointing to objects in their pool; dolphins aligned their bodies with the anterior-posterior axis to the carcass and remained for much longer than 2 s. Monitoring behaviour, as described by Xitco *et al.*, was not observed, but would not be expected since all attendants repeatedly returned to the carcass and thus, can be assumed to recognize the object of interest. Could pointing by dolphins be used as a social tool? Were they communicating with other attendants about the nature of the motionless body?

Alternatively, the dead dolphin was a sub-adult male, supposedly at the age when alliances and partnerships are established (Wells *et al.*, 1987; Connor *et al.*, 1992). Perhaps the attendant males—mostly sub-adults themselves—were communicating amongst themselves with respect to the dead individual's position within the social structure of the group. Östman (1991) showed that the sexual interaction between two males within a captive dolphin group was a component of their dominance relationship. In Florida and Monkey Mia, Australia, male dolphins form pair bonds with coefficients of association strength similar to the mother/calf bond. Males in both locations routinely compete for females and engage in fights with other dolphin pairs or triplets (Wells *et al.*, 1987; Connor *et al.*, 1992). As yet, coefficients of association among male bottlenose dolphins around Mikura has not been significantly linked with socio-sexual behaviour or an observed hierarchy (Shimomaki, 2000). However, more data with a larger sample size are required to address this possibility adequately.

### *Herd and mate-guarding behaviour*

The male dolphins did not attempt to lift or to bring either body to the surface, but rather "stood guard" over each carcass. Similar guarding behaviour of dead peers is represented in the literature on terrestrial social animals (e.g., chimpanzees, Goodall, 1986; elephants, Moss, 1988). Sexual behaviour is another possible explanation for the attending behaviour that these two males directed toward the dead female; however, at no time during our observations was an erect penis documented from either adult male. The presence of dolphins with an erect penis outside our observation periods cannot be ruled-out. Our observations were limited in scope and duration, and our presence could have elicited the males' protective behaviour, thus attempts to lift the female to the surface (i.e., an instinctive response) or to copulate with her body (sexual response) may have occurred outside our observations.

Mate-guarding might explain the activity witnessed in the first carcass observation; however, the dead dolphin in the second carcass observation was a male and likely not previously pursued as a mate. It is possible that the initial reactions of the attendant dolphins in the second carcass observation were mildly succorant—standing by, intense investigation of the chest region. Drowning was the confirmed cause of death; water in the lungs would change the reflective nature of organs usually filled with air. Echolocation would indicate the change in organ density (Au, 1993). But, would dolphins perceive and recognize this difference? Pack & Herman (1995) examined the cross-modality of

echolocation and vision in dolphins with data suggesting that dolphins perceive click echoes with reference to visual images. Whether dolphins have stored visual memory of their anatomy is not known, though the behaviour witnessed in part 1 and 3 of the second carcass observation (Table 2) implies that dolphins might recognize the difference between air-filled and water-filled lungs. A distinct change in behaviour was marked by penile erections (Table 2, part 2) after the period marked by agitated investigative behaviours of the attendants to the carcass (Table 2, part 1), suggesting that the dolphins' curiosity with respect to the carcass shifted. Whether interest in the carcass shifted because of information received from direct investigation or passive observation by the dolphins is undeterminable, though both modalities were likely involved.

Similarly, the possibility that a sexual component factored into the attendant behaviour directed towards the carcass cannot be discounted. Penile erections were observed with an increase in tactile contact with the carcass (Table 2, parts 2 & 3). In this dolphin study group, Shimomaki (2000) documented interactions among sub-adult males where courtship behaviours were practiced. Groups of sub-adult males would shift roles between the female and male positions while exchanging pectoral fins rubs, body contact, and penis rubs (i.e., dolphins in the male role would rub their penis' along the body of the 'female' dolphin). A male humpback whale displayed sexual behaviours including pectoral fin grasps, an erect penis, and a pulsating genital slit while interacting with the carcass of another male humpback whale (Pack *et al.*, 1998). This supports the notion that the attendant sub-adult male dolphins might have been aroused by the carcass. The mildly aggressive actions of individuals at the carcass could be considered an attempt to guard it from conspecifics, though this would not fit a strict definition of mate-guarding.

### Conclusions

The increasing representation of reports of novel behaviour (e.g., succorant epimeletic care) in the literature continues to refine and clarify our knowledge of the complex social lives of non-human animals. Other than as a 'stranding' along a coastline, dead dolphins are infrequently sighted. More rare is the opportunity to document the activity of other dolphins in close proximity to a dolphin carcass. It is possible that the behavioural descriptions and discussed interpretations with respect to the attendants at both carcasses are not mutually exclusive. Novel behaviours, such as those described here, offer a window into the subtleties and complex dynamics that define dolphin social life.

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