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CEPHALOPOD REMAINS FROM A CUVIER'S BEAKED WHALE (*ZIPHIUS CAVIROSTRIS*) STRANDED IN KODIAK, ALASKA

N. R. FOSTER AND M. P. HARE

Ziphius cavirostris is the beaked whale (Ziphiidae) most commonly stranded on the coasts of North America according to reports collected at the Smithsonian Institute by the Scientific Event Alert Network (SEAN) and the Marine Mammal Events Program (MMEP).[1] A review of Northeast Pacific *Ziphius* strandings by Mitchell (1968) documents 35 strandings between 1945 and 1965. A minimum of 16 stranding events of *Ziphius* have been reported from Alaska since 1967 at latitudes as high as 59 degrees North in the Bering Sea (Smithsonian SEAN and MMEP files). These strandings, as well as a Japanese fishery for this species (Nishiwaki and Oguro 1972; Omura et al. 1955), are the primary sources of life history information on *Ziphius*.

[1] Scientific Event Alert Network/Marine Mammal Events Program, Division of Mammals, National Museum of Natural History, Smithsonian Institution, Washington D. C., 20560.

TABLE 1. Occurrence and sizes of squid lower beaks in stranded *Ziphius*. Only intact beaks were measured. Broken beaks include those which lacked wings or had broken rostrum tips.

Species	Intact beaks	Broken beaks*	Total	Lower rostral lengths mean, range (mm)
Gonatidae				
Gonatopsis/Berryteuthis	30	2	32	6.0, 5.1-7.0
Gonatus sp.	4	1	5	7.6, 6.1-8.1
Cranchiidae				
Taonis sp.	62		62	6.8, 4.1-8.0
Chiroteuthidae				
Chiroteuthis sp.	30	10	40	4.6, 3.6-5.6
*Taonis/Chiroteuthis**		319	319	
Total			458	

* *Taonis* and *Chiroteuthis* were difficult to distinguish when not intact.

Despite the relative abundance of material potentially available from strandings and fisheries, few detailed accounts of stomach contents have been published for this species. Kenyon (1961) reported unidentified shrimp and Gonatid squid in the stomach of one *Ziphius* stranded in the Aleutians. In Japanese waters, the unidentified remains of squid were found in *Ziphius* taken within the 1000 m depth contour, whereas fish remains predominated from deeper waters (Nishiwaki and Oguro 1972). Heyning (in press) summarizes information on *Ziphius* stomach contents from literature sources. He contributes the only other documentation of stomach contents from a North Pacific *Ziphius*, that of a single animal stranded in Humboldt County, California (JEH 230), which contained the squid *Octopoteuthis deletron* and unidentified Gadiform fishes. This note documents the species identity of cephalopod beaks found in the stomach of a *Ziphius* specimen found freshly stranded 27 January 1987 on Holiday Beach, Kodiak Island, Alaska (57°41'N, 152°28'W).

When necropsied on 3 February 1987, moderate decomposition had taken place. The subadult female had six dentinal growth layer groups (Heyning, in litt.) and ovaries with no visible corpora. Standard length of this specimen was 5.93 m; previously the largest known immature female was a 5.5 m animal from Japan (Heyning, in press). The natural coloration was obliterated, but on the ventrum there were at least ten oval scars presumably from lamprey or cookie-cutter sharks of the genus *Isistius* (Mead et al. 1982). There was no trauma other than that often produced by a beach stranding. Parasitic infestation of the kidney by *Crassicauda* sp. was severe. The nematodes and fibrotic tracts were concentrated in the kidney ducts, but mineralization of tissue and pussy exudate were pervasive throughout both kidneys. The lungs, liver, and pancreas were too decomposed for thorough examination. External measurements, stomach contents, and the complete skeleton have been deposited at the University of Alaska Museum (UAM16547).

Food remains were hand picked from the stomach in the field. No remains were present in the main (first) stomach, and only small quantities were in all but the last pyloric chamber. Squid beaks were tangled by fibrous strands to the walls of this last chamber, contributing to approximately a 10 percent loss of the material.

The stomach contents from all chambers were received frozen at the University of Alaska Museum Aquatic Collection. They were thawed, then rinsed on a 0.5 mm screen. This washed material consisted of about two liters of solids, primarily squid beaks (458 lower, 547 upper), squid eye lenses, unrecognizable soft tissues, probably from squid, and crustacean fragments. The squid beaks were disarticulated, the lenses were peeling apart, and no traces of tentacles, radulas, or other parts could be identified. From a sample of lower beaks, Mr. C. H. Fiscus (National Marine Fisheries Service, Seattle, Washington) identified four kinds of squid: *Taonis* sp., *Chiroteuthis* sp., *Gonatus middendorfii* or *G. madokai*, and an undetermined *Gonatopsis* or *Berryteuthis* (Fiscus, in litt.) All are taxa known from the Gulf of Alaska (Nesis 1973). All the lower beaks were sorted according to Fiscus' identifications (Table 1) and accessioned in the UAM Aquatic Collection (number 1988-7).

Except for mandibles and chelae, the crustacean fragments were generally indistinguishable. The shape of the chelae and the comb-like teeth along their cutting edge indicate a Pasiphaeid shrimp. The mandible and chela fragments match intact mandibles and chelae from *Pasiphaea tarda*. This

deep water pelagic shrimp is known to occur in the Gulf of Alaska (Butler 1980). It is unknown whether the shrimp fragments represented the squids' food items or had been ingested directly by the whale.

The stomach contained some non-food items. One fragment of wood and fibrous material measured 2.5 cm long, there were a few flakes of white paint 2 by 5 mm, and one metallic flake measuring 3 by 4 mm.

The poor condition of the stomach contents from this specimen allows few inferences on the size range of the squid consumed, their geographic distribution, or the relative importance of each taxon as prey. Off the California coast, *Taonis* and *Chiroteuthis* species, which account for over 90% of the lower beaks, are found at depths of 500–700 m, and the gonatid species are found at similar depths during the day, but migrate to the upper 100 to 500 m at night (Roper and Young 1975). Observations on vertical distribution of squid are not available for the Gulf of Alaska.

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