

FOREWORD

A tribute to Kazunari Yano (1956–2006)

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Kazunari Yano may not be a familiar name to many readers of the *Journal of the Marine Biological Association* (Figure 1). Indeed, he only published a single paper in this journal (Yano, 1995). However, Kazunari was a dedicated fish biologist with an extensive publications record and his pioneering biological studies on deep-sea sharks ensure that his work is much cited in the scientific literature (Musick, 2007), especially in those papers addressing deep-water squaloid sharks (e.g. Girard & Du Buit, 1999; Clarke *et al.*, 2001; McLaughlin & Morrissey, 2005; Bañón *et al.*, 2008). Kazunari's life was tragically cut short in 2006, following a battle with cancer. This short biography and special issue of the *Journal* is dedicated to his memory.

Kazu's scientific career

Kazunari gained his PhD from the Graduate School of Marine Science and Technology at Tokai University in 1986, where he studied the morphology, systematics, taxonomy and ecology of squaliform sharks (Yano, 1985). Indeed, it is those biologists working with deep-water sharks who will be most familiar with Kazunari's work. The uncertainty in the taxonomy of these species, the limited biological information available, that many of these species seem to have quite cosmopolitan distributions, and that deep-water fisheries have expanded in many areas in recent decades, means that Kazunari's studies are frequently referred to in many scientific studies conducted around the world.

Kazunari's dedication to collecting biological information for such a wide range of species means that he is probably uniquely placed among ichthyologists in the way that he managed to write informative papers on various elements of the taxonomy and life history of so many species of shark (e.g. Yano & Kugai, 1993b; Yano, 1999), especially from deep-sea habitats. Indeed, Kazunari published important accounts on the taxonomy and biology of gulper sharks *Centrophorus* spp. (Yano & Tanaka, 1983a, 1985; Yano & Kugai, 1993a), black dogfish *Centroscyllium fabricii* (Yano, 1995), Portuguese dogfish *Centroscymnus coelolepis* (Yano & Tanaka, 1983b, 1984a, 1987, 1988), birdbeak dogfish *Deania* spp. (Yano, 1991), lantern sharks *Etmopterus* spp. (Yano & Tanaka, 1989; Yano, 1997; Yano & Musick, 2000), slender smooth-hound *Gollum attenuatus* (Yano, 1993a, b), rough sharks *Oxynotus* spp. (Yano & Matsuura, 2002; Yano *et al.*, 2002), false catshark *Pseudotriakis microdon* (Yano, 1992;

Yano & Musick, 1992), velvet dogfish *Scymnodon* spp. (Yano & Tanaka, 1984b), sleeper sharks *Somniosus* spp. (Tanaka *et al.*, 1982; Yano *et al.*, 2004, 2007) and viper dogfish *Trigonognathus kabeyai* (Yano *et al.*, 2003).

Kazunari was even able to collect data and write papers on those rare and infrequent species that many ichthyologists can only dream about encountering, such as frilled shark *Chlamydoselachus anguineus* (Tanaka *et al.*, 1990), goblin shark *Mitsukurina owstoni* (Yano *et al.*, 2007) and megamouth shark *Megachasma pelagios* (Yano *et al.*, 1997, 1998, 1999). Kazunari also described three new species of shark: Japanese velvet dogfish *Scymnodon ichiharai* (Yano & Tanaka, 1984b), Japanese rough shark *Oxynotus japonicus* (Yano & Murofushi, 1985) and splendid lantern shark *Etmopterus splendidus* (Yano, 1988).

In addition to his work on deep-water sharks, Kazunari was an avid diver and managed to make biological observations on various reef-associated elasmobranchs, including manta rays (Yano *et al.*, 1999) and carcharhinid sharks (Yano & Morrissey, 1999). Not only did Kazunari contribute important investigations of elasmobranch ecology, he also was always willing to collaborate in additional biological studies that would further our knowledge of cartilaginous fish (e.g. Ida *et al.*, 1985; Uchida *et al.*, 1996; Yano *et al.*, 2000).

Kazunari also found time to co-author or co-edit two important books on elasmobranchs. These include the exceptional account of the intensive biological investigations conducted on the first female megamouth shark examined (Yano *et al.*, 1997). This book contained over 20 chapters on everything from the genetics of the megamouth to gross anatomy, and in addition to acting as senior editor, Kazunari co-authored eight of the chapters (Castro *et al.*, 1997; Nakaya *et al.*, 1997; Takada *et al.*, 1997; Tanaka & Yano, 1997; Yabumoto *et al.*, 1997; Yano *et al.*, 1997a, b, c).

Although Kazunari was a distinguished and respected elasmobranch biologist, his work in other fields of marine science should not be forgotten. As well as the plethora of scientific papers that Kazunari wrote on elasmobranchs, he also undertook studies on tuna (Yano & Abe, 1998; Yamada *et al.*, 2005), salmonids (Yano *et al.*, 1984; Yano & Nakamura, 1992), sea turtles (Yano & Tanaka, 1991) and on the depredation of longline catches by killer whales *Orcinus orca* (Yano & Dahlheim, 1995a, b).

In the years preceding his death, Kazunari worked hard on what many will regard as his swan song, his co-authored



Fig. 1. Kazunari Yano during a trip to England (April 1999).

monograph on the sharks and batoids of Malaysia and Brunei Darussalam (Yano *et al.*, 2005), which was published shortly before his death. Kazunari's wealth and breadth of knowledge,



Fig. 2. Kazunari Yano and John Morrissey outside the Jardin de Plantes (Paris, April 1999) on the street commemorating the famous French ichthyologist and naturalist George Cuvier, author of *Histoire naturelle des poissons*.

dedication to ichthyology (including field studies), and commitment to publishing made him greatly admired by his peers.

Kazunari's professional excellence is only a part of his story. Kazunari was also kind, intelligent, funny and amiable, and for many of his colleagues he became a good friend who opened his home to them whenever they had the opportunity to visit Japan for research, a conference, or just while on holiday (Figure 2). Most importantly, he was a wonderful husband to his wife, Kaori, and beloved father to their four children, Toshikazu, Nobukazu, Nagisa and Hidekazu.

REFERENCES

- Bañón R., Piñeiro C. and Casas M. (2008) Biological observations on the gulper shark *Centrophorus granulosus* (Chondrichthyes: Centrophoridae) off the coast of Galicia (north-western Spain, eastern Atlantic). *Journal of the Marine Biological Association of the United Kingdom* 88, 411–414.
- Castro J. I., Clark E., Yano K. and Nakaya K. (1997) The gross anatomy of the female reproductive tract and associated organs of the Fukuoka megamouth shark (*Megachasma pelagios*). In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 115–119.
- Clarke M.W., Connolly P.L. and Bracken J.J. (2001) Aspects of reproduction of the deep water sharks *Centroscymnus coelolepis* and *Centrophorus squamosus* from west of Ireland and Scotland. *Journal of the Marine Biological Association of the United Kingdom* 81, 1019–1029.
- Girard M. and Du Buit M.-H. (1999) Reproductive biology of two deep-water sharks from the British Isles, *Centroscymnus coelolepis* and *Centrophorus squamosus*. *Journal of the Marine Biological Association of the United Kingdom* 79, 923–931.
- Ida H., Asahida T., Yano K., Tanaka S. and Arai R. (1985) Karyotypes of two sharks, *Chlamydoselachus anguineus* and *Heterodontus japonicus*, and their systematic implications. In Uyeno T., Arai R., Taniuchi T. and Matsuura K. (eds) *Second International Conference on Indo-Pacific Fishes. Tokyo (Japan), 29 July–3 August 1985*. Tokyo: Ichthyological Society of Japan, pp. 158–163.
- McLaughlin D.M. and Morrissey J.F. (2005) Reproductive biology of *Centrophorus* cf. *uyato* from the Cayman Trench, Jamaica. *Journal of the Marine Biological Association of the United Kingdom* 85, 1185–1192.
- Musick J.A. (2007) Memories of Dr. Kazunari Yano (1956–2006). *Ichthyological Research* 54, 100.
- Nakaya K., Yano K., Takada K. and Hiruda H. (1997) Morphology of the first female megamouth shark, *Megachasma pelagios* (Elasmobranchii: Megachasmidae), landed at Fukuoka, Japan. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 51–62.
- Takada K., Hiruda H., Wakisaka S., Kudo S. and Yano K. (1997) A summary of the freezing, thawing, preservation and display methodology used on a large megamouth shark, *Megachasma pelagios*. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 11–19.
- Tanaka S., Shiobara Y., Hioki S., Abe H., Nishi G., Yano K. and Suzuki K. (1990) The reproductive biology of the frilled shark, *Chlamydoselachus anguineus*, from Suruga Bay, Japan. *Japanese Journal of Ichthyology* 37, 273–291.
- Tanaka S. and Yano K. (1997) Histological observations on the reproductive organs of a female megamouth shark, *Megachasma pelagios*, from Hakata Bay, Japan. In Yano K., Morrissey J.F., Yabumoto Y. and

- Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 121–129.
- Tanaka S., Yano K. and Ichihara T.** (1982) Notes on a Pacific sleeper shark, *Somniosus pacificus*, from Suruga Bay, Japan. *Journal of the Faculty of Marine Science and Technology (Tokai University)* 15, 345–358.
- Uchida S., Toda M., Teshima K. and Yano K.** (1996) Pregnant white sharks and full-term embryos from Japan. In Klimley A.P. and Ainley D. (eds) *Great white sharks—the biology of Carcharodon carcharias*. New York: Academic Press, pp. 139–155.
- Yabumoto Y., Goto M., Yano K. and Uyeno T.** (1997) Dentition of a female megamouth, *Megachasma pelagios*, collected from Hakata Bay, Japan. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 63–75.
- Yamada H., Takahashi M., Yano K., Tanaka S. and Tanaka Y.** (2005) Biology and resources of the Pacific bluefin tuna (*Thunnus orientalis*). *Memoirs of the Faculty of Agriculture of Kinki University* 38 (Special Issue), 10–15.
- Yano K.** (1985) *Studies on morphology, phylogeny, taxonomy and biology of Japanese squaloid sharks, order Squaliformes*. PhD thesis. Tokai University, Shimizu, 335 pp.
- Yano K.** (1988) A new lantern shark *Etmopterus splendidus* from the East China Sea and Java Sea. *Japanese Journal of Ichthyology* 34, 421–425.
- Yano K.** (1991) Catch distribution, stomach contents and size at maturity of two squaloid sharks, *Deania calceus* and *D. crepidalbus*, from the southeast Atlantic off Namibia. *Bulletin of the Japanese Society of Fisheries Oceanography* 55, 189–196.
- Yano K.** (1992) Comments on the reproductive mode of the false catshark *Pseudotriakis microdon*. *Copeia* 1992, 460–468.
- Yano K.** (1993a) Distribution and food habits of the slender smoothhound, *Gollum attenuatus*, from the waters around New Zealand. *Japanese Journal of Ichthyology* 39, 345–356.
- Yano K.** (1993b) Reproductive biology of the slender smoothhound, *Gollum attenuatus*, collected from New Zealand waters. *Environmental Biology of Fishes* 38, 59–71.
- Yano K.** (1995) Reproductive biology of the black dogfish, *Centroscyllium fabricii*. *Journal of the Marine Biological Association of the United Kingdom* 75, 285–310.
- Yano K.** (1997) First record of the brown lanternshark, *Etmopterus unicolor*, from the waters around New Zealand and comparison with the southern lantern shark, *E. granulosus*. *Ichthyological Research* 44, 61–72.
- Yano K.** (1999) Chondrichthyans of the Ryukyu Islands, Japan. In S ret B. and Sire J.-Y. (eds) *Proceedings of the 5th Indo-Pacific Fish Conference. Noum a, New Caledonia, 3–8 November 1997*. Paris: Soci t  Francaise d'Ichtyologie et Institut de Recherche pour le D veloppement, pp. 351–365.
- Yano K. and Abe O.** (1998) Depth measurements of tuna longline by using time–depth recorder. *Nippon Suisan Gakkaishi* 64, 178–188.
- Yano K., Ahmad A., Gambang A.C., Idris A.H., Solahuddin A.R. and Aznan Z.** (2005) *Sharks and rays of Malaysia and Brunei Darussalam*. Special Publication, Southeast Asian Fisheries Development Center, Marine Fishery Resources Development and Management Department (Malaysia), 557 pp.
- Yano K. and Dahlheim M.E.** (1995a) Behavior of killer whales *Orcinus orca* during longline fishery interactions in the southeastern Bering Sea and adjacent waters. *Fisheries Science* 61, 584–589.
- Yano K. and Dahlheim M.E.** (1995b) Killer whale, *Orcinus orca*, depredation on longline catches of bottomfish in the southeastern Bering Sea and adjacent waters. *Fishery Bulletin* 93, 355–372.
- Yano K., Goto M. and Yabumoto Y.** (1997a) Dermal and mucous denticles of a female megamouth shark, *Megachasma pelagios*, from Hakata Bay, Japan. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 77–91.
- Yano K., Ichihara T., Nakamura A. and Tanaka S.** (1984) Escape behaviour of the chum salmon *Oncorhynchus keta* upon encountering Dall's porpoise *Phocoenoides dalli*. *Bulletin of the Japanese Society of Scientific Fisheries* 50, 1273–1277.
- Yano K. and Kugai K.** (1993a) Taiwan gulper shark, *Centrophorus niaukang*, from the Okinawa Islands, Japan. *Bulletin of Seikai National Fisheries Research Institute* 71, 41–49.
- Yano K. and Kugai K.** (1993b) Deep-sea chondrichthyans collected from the waters around the Okinawa Islands: results of catch analysis of bottom longlines. *Bulletin of Seikai National Fisheries Research Institute* 71, 51–65.
- Yano K. and Matsuura K.** (2002) A review of the genus *Oxynotus* (Squaliformes, Oxynotidae). *Bulletin of the National Science Museum (Tokyo)* 28, 109–117.
- Yano K., Matsuura K. and Tsukada O.** (2002) Redescription of the rare squaloid shark *Oxynotus japonicus* from Suruga Bay and the Enshu-nada Sea, Japan. *Species Diversity* 7, 363–369.
- Yano K., Miya M., Aizawa M. and Noichi T.** (2007) Some aspects of the biology of the goblin shark, *Mitsukurina owstoni*, collected from the Tokyo Submarine Canyon and adjacent waters, Japan. *Ichthyological Research* 54, 388–398.
- Yano K., Mochizuki K., Tsukada O. and Suzuki K.** (2003) Further description and notes of natural history of the viper dogfish, *Trigonognathus kabeyai* from the Kumano-nada Sea and the Ogasawara Islands, Japan (Chondrichthyes: Etmopteridae). *Ichthyological Research* 50, 251–258.
- Yano K., Mori H., Minamikawa K., Ueno S., Uchida S., Nagai K., Toda M. and Masuda M.** (2000) Behavioral response of sharks to electric stimulation. *Bulletin of Seikai National Fisheries Research Institute* 78, 13–30.
- Yano K. and Morrissey J.F.** (1999) Confirmation of blacktip shark, *Carcharhinus limbatus*, in the Ryukyu Islands and notes on possible absence of *C. melanopterus* in Japanese waters. *Ichthyological Research* 46, 193–198.
- Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds)** (1997) *Biology of the megamouth shark*. Tokai: Tokai University Press, 195 pp.
- Yano K. and Murofushi M.** (1985) A new prickly dogfish, *Oxynotus japonicus*, from Japan. *Japanese Journal of Ichthyology* 32, 129–136.
- Yano K. and Musick J.A.** (1992) Comparison of morphometrics of Atlantic and Pacific specimens of the false catshark, *Pseudotriakis microdon*, with notes on stomach contents. *Copeia* 1992, 877–886.
- Yano K. and Musick J.A.** (2000) The effect of the mesoparasitic barnacle *Anelasma* on the development of reproductive organs of deep-sea squaloid sharks, *Centroscyllium* and *Etmopterus*. *Environmental Biology of Fishes* 59, 329–339.
- Yano K. and Nakamura A.** (1992) Observations on the effect of visual and olfactory ablation on the swimming behavior of migrating adult chum salmon, *Oncorhynchus keta*. *Japanese Journal of Ichthyology* 39, 67–84.
- Yano K., Sato F. and Takahashi T.** (1999) Observations of mating behavior of the manta ray, *Manta birostris*, at the Ogasawara Islands, Japan. *Ichthyological Research* 46, 289–296.

- Yano K., Stevens J.D. and Compagno L.J.V.** (2004) A review of the systematics of the sleeper shark genus *Somniosus* with redescription of *Somniosus (Somniosus) antarcticus* and *Somniosus (Rhinoscyrnus) longus* (Squaliformes: Somniosidae). *Ichthyological Research* 51, 360–373.
- Yano K., Stevens J.D. and Compagno L.J.V.** (2007) Distribution, reproduction and feeding of the Greenland shark *Somniosus (Somniosus) microcephalus*, with notes on two other sleeper sharks, *Somniosus (Somniosus) pacificus* and *Somniosus (Somniosus) antarcticus*. *Journal of Fish Biology* 70, 374–390.
- Yano K. and Tanaka S.** (1983a) Biological studies on squaloid sharks from Suruga Bay, Japan. In *Proceedings of the Second North Pacific Aquaculture Symposium*, pp. 405–414.
- Yano K. and Tanaka S.** (1983b) Portuguese shark, *Centroscyrnus coelolepis* from Japan, with notes on *C. owstoni*. *Japanese Journal of Ichthyology* 30, 208–216.
- Yano K. and Tanaka S.** (1984a) Some biological aspects of the deep sea squaloid shark *Centroscyrnus* from Suruga Bay, Japan. *Bulletin of the Japanese Society of Scientific Fisheries* 50, 249–256.
- Yano K. and Tanaka S.** (1984b) Review of the deep sea squaloid shark genus *Scymnodon* of Japan, with a description of a new species. *Japanese Journal of Ichthyology* 30, 341–360.
- Yano K. and Tanaka S.** (1985) A telemetric study on the movements of the deep sea squaloid shark, *Centrophorus acus*. In Uyeno T., Arai R., Taniuchi T. and Matsuura K. (eds) *Second International Conference on Indo-Pacific Fishes. Tokyo (Japan), 29 July–3 August 1985*. Tokyo: Ichthyological Society of Japan, pp. 372–380.
- Yano K. and Tanaka S.** (1987) Reproductive organs of deep sea sharks, *Centroscyrnus owstoni* and *C. coelolepis*. *Journal of the School of Marine Science and Technology (Tokai University)* 25, 57–67.
- Yano K. and Tanaka S.** (1988) Size at maturity, reproductive cycle, fecundity and depth segregation of the deep sea squaloid sharks *Centroscyrnus owstoni* and *C. coelolepis* in Suruga Bay, Japan. *Nippon Suisan Gakkaisha* 54, 167–174.
- Yano K. and Tanaka S.** (1989) Hermaphroditism in the lantern shark *Etmopterus unicolor* (Squalidae, Chondrichthyes). *Japanese Journal of Ichthyology* 36, 338–345.
- Yano K. and Tanaka S.** (1991) Diurnal swimming patterns of loggerhead turtles during their breeding period as observed by ultrasonic telemetry. *Bulletin of the Japanese Society of Scientific Fisheries* 57, 1669–1678.
- Yano K., Toda M., Uchida S. and Yasuzumi F.** (1997b) Gross anatomy of the viscera and stomach contents of a megamouth shark, *Megachasma pelagios*, from Hakata Bay, Japan, with a comparison of the intestinal structure of other planktivorous elasmobranchs. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 105–113.
- Yano K., Tsukada O. and Furuta M.** (1998) Capture of megamouth shark number 12 from Atawa, Mie, Japan. *Ichthyological Research* 45, 424–426.
- Yano K., Yabumoto Y., Ogawa H., Hasegawa T., Naganobu K., Matumura S., Misuna Y. and Matumura K.** (1997c) X-ray observations on vertebrae and dentition of a megamouth shark, *Megachasma pelagios*, from Hakata Bay, Japan. In Yano K., Morrissey J.F., Yabumoto Y. and Nakaya K. (eds) *Biology of the megamouth shark*. Tokai: Tokai University Press, pp. 21–29.
- and
- Yano K., Yabumoto Y., Tanaka S., Tsukada O. and Furuta M.** (1999) Capture of a mature female megamouth shark, *Megachasma pelagios*, from Mie, Japan. In Séret B. and Sire J.-Y. (eds) *Proceedings of the 5th Indo-Pacific Fish Conference. Nouméa, New Caledonia, 3–8 November 1997*. Paris: Société Française d'Ichtyologie et Institut de Recherche pour le Développement, pp. 335–349.