

Hunting dogs as environmental adaptations in Jōmon Japan

Angela R. Perri*

*Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Deutscher Platz 6, Leipzig Germany 04103 (Email: angela.perri@eva.mpg.de)

Was the use of hunting dogs an adaptation to the post-glacial deciduous forest environment in the northern temperate zone? Dog burials in Jōmon Japan appear closely associated with a specific environment and with a related subsistence economy involving the hunting of forest ungulates like sika deer and wild boar. Dogs were valued as important hunting technology, able to track and retrieve wounded animals in difficult forested environments, or holding them until the hunter made the final kill. Greater numbers of dog burials during the later Jōmon periods may reflect a growing dependence on hunting dogs to extract ungulate prey from forests in an increasingly resource-strained seasonal environment.

Keywords: Japan, Jōmon, dog burial, hunting

SUPPLEMENTARY MATERIAL

Table S1. Additional information on the Jōmon-period dog burials. #BUR = number of burials from each site (* indicates an unknown number); SM=shell midden site.

SITE	PHASE	#BUR	SM	NOTES	REFERENCE
Natsushima	Initial	1	Y		Shigehara & Hongo 2000
Kamikuroiwa	Initial	2	N	one dog in curled position, both adults, Shiba Inu size; tooth damage suggested to be from hunting of wild boar	Esaka <i>et al.</i> 1967; Shigehara & Hongo 2000; Sato <i>et al.</i> in press
Hanazumi	Early	*	Y		Shibata 1969
Nishinoyato	Early	1	Y	buried in curled position,	Toki 1936

SITE	PHASE	#BUR	SM	NOTES	REFERENCE
				broken/healed axis	
Ugasaki	Early	1	Y	'old' dog, slightly bigger than modern Shiba Inu, mandibular infection, broken/healed right femur	Oikawa 1980
Nakazawahama	Early-Final	3	Y	all adult dogs	Sato 1995
Kasori North	Middle	2	Y		Takiguchi 1977
Fujiwara Kannondo	Middle	*	Y		Kobayashi <i>et al.</i> 2004
Ebigasaku	Middle	*	Y		Shibata 1969
Takanekido	Middle	3	Y	3-4 years (1), 5-6 years (1), over 12 years (1); oldest dog has broken/healed limb bone	Nishino & Okazaki 1971
Shimoota	Middle	1	Y		Sugaya & Toizumi 1998
Ohata	Middle	27	Y		Manome 1975
Kaminouchi	Middle	1	Y		Kashimura 1994
Wanaba	Middle	*	N		Educational Board of Hara Village 2010
Soya	Middle-Late	2	Y	adult dog (burial 1), 6-7 month old dog (burial 2); both dogs same size as modern Shiba Inu; oyster shell bracelet with burial 2	Horikoshi 1977
Monzen	Middle-Late	*	Y		Matsumoto 1917; Hasebe 1925a; Shibata 1969
Kawakuda Rihibiki	Middle-Late	*	Y		Matsumoto 1929; Shibata 1969
Minamizakai	Middle-Final	*	Y		Goto 1969
Yahagi	Late	2	Y		Center for Cultural Properties of Chiba

SITE	PHASE	#BUR	SM	NOTES	REFERENCE
					Prefecture 1981
Kasori South	Late	3	Y		Takiguchi 1977
Sanganji	Late	3	Y	broken/healed vertebrae	Mori 1988
Ishigami	Late	1	Y	newborn or fetus	Kaneko 1977
Nishikaizuka	Late	*	Y		Naora 1965
Tsutsumi	Late	1	Y		Education Board of Chigasaki City 1963
Kaitori	Late	5	Y	4-5 years old (1); healed bone injuries noted, suggest injuries are from hunting accident	Kusama & Kaneko 1971
Shimofunato	Late-Final	1	Y		Editorial Committee of Ofunato City 1978
Nakasawame	Late-Final	1	Y	3-4 months old	Sudo 1985
Kainohana	Late-Final	*	Y		Yawata & Daigaku 1973
Terawaki	Late-Final	1	Y		Watanabe 1966
Usuiso	Late-Final	1	Y	'old' dog, broken/healed right tibia, grave covered with stones	Otake 1983
Yoshigo	Late-Final	12	Y	3 young, 9 adult	Hasebe 1952; Saito 1952
Motokariya	Late-Final	*	Y		Naora 1972
Oohora	Final	*	Y		Hasebe 1925b; Shibata 1969
Satohama	Final	*	Y		Okamura 1980, 1986
Tagara	Final	22	Y	young and old dogs, youngest 2-3 months; some dogs have broken/healed bones; 9 male and 6 female skulls reconstructed, size similar to Shiba Inu	Hirasawa 1986; Shigehara & Hongo 2000
Karekinomiya	Final	1	Y	same size as modern Shiba Inu	Sumiyoshi 1981

SITE	PHASE	#BUR	SM	NOTES	REFERENCE
Ikawazu	Final	7	Y	all dogs are adults, most are 'old'	Editorial Committee of the Report of Ikawazu Shell Midden 1972
Koyamadai	Final	5	Y	3 young, 2 adult	Nagamatsu 1976
Kamishinjuku	"Jōmon"	*	Y		Shibata 1969

References

- Center for Cultural Properties of Chiba Prefecture. 1981. Yahagi kaidzuka. Mizu wa, Chiba ken no jimukyoku no sakuhin (in Japanese)
- Editorial Committee of Ofunato City. 1978. Ōfunato-shi no rekishi (in Japanese).
- Editorial Committee of the Report of Ikawazu Shell Midden. 1972. Ikawaze kaidzuka. Atsumigōri, Aichi ken atsumimachi no kyōiku iinkai (in Japanese).
- Educational Board of Hara Village. 2010. Wanaba to Tochinoki saito. Haramura no kyōiku iinkai (in Japanese).
- Education Board of Chigasaki City. 1963. Tsutsumi kaidzuka. Chigasaki-shi no kyōiku iinkai (in Japanese).
- ESAKA T., K. OKAMOTO & S. NISHIDA. 1967. Kamikuroiwa, Ehime ken no iwa no hinansho, in *Nihon no dōkutsu saito*: 224–36. Tokyo: Heibonsha (in Japanese).
- GOTO, K. 1969. Minamizakai kaidzuka kara kisai resukyū hakkutsu hōkoku-sho no setsumeikai. Miyagi ken no kyōiku iinkai (in Japanese).
- HASEBE, K. 1925a. Sekki jidai no kachiku-ka sa reta inu. *Jinrui-gaku no jānaru* 40: 103–108 (in Japanese).
- 1925b. Rikuzen de Oohora kaidzuka no hōkoku. *Jinrui-gaku no jānaru* 20: 349–60 (in Japanese).
- 1952. Inu ga nokorimasu. Bunkazai no hozon no tame no kyōkai (in Japanese).
- HIRASAWA, E. 1986. Tagara kaidzuka I, III. Kensetsushō de Miyagi ken to Tōhoku no kensetsu-kyoku no kyōiku iinkai (in Japanese).

- HORIKOSHI, M. 1977 Daizu kaidzuka, deria de no hakkutsu no burīfingu. Ichikawa-shi no kyōiku iinkai. (in Japanese).
- KANEKO, H. 1977. Kawaguchi-shi no ishigami kaidzuka. Kawaguchi-shi no kyōiku iinkai (in Japanese).
- KASHIMURA, T. 1994. Kaminouchi no hakkutsu genba. Iwaki-shi no kyōiku to bunka no tame no Iwaki-shi to shakai no kyōiku iinkai (in Japanese).
- KOBAYASHI, T. 2004. *Jomon reflections: forager life and culture in the prehistoric Japanese archipelago*. Oxford: Oxbow.
- KUSAMA, S & H. KANEKO. 1971. Kaitori kaidzuka. Bunkazai hanaizumichō, Iwate ken oyobi Dōbutsuaigokyōkai no kyōiku iinkai, Iwate ken (in Japanese).
- MANOME, J. 1975. Ōhata kaidzuka no hakkutsu hōkoku. Iwaki-shi no kyōiku iinkai (in Japanese).
- MATSUMOTO, H. 1917. The dog. *Zoological Science* 29: 181–82.
- 1929. Rikuzen de Onomura, Monou-gun no Kawakuda - Rihibiki no repōto (in Japanese).
- MORI, Y. 1988. Sanganji kaidzuka. Fukushima-ken no hakubutsukan (in Japanese).
- NAGAMATSU, M. 1976. Koyamadai kaidzuka. Shuppan kyōkai (in Japanese).
- NAORA, N. 1965. Miyanishi kaidzuka. Higashiuramachi no kyōiku iinkai (in Japanese).
- 1972. Motokariya kaidzuka. Kariya-shi no kyōiku iinkai (in Japanese).
- NISHINO, H. & F. OKAZAKI. Takanekido. Funabashi shigikai (in Japanese).
- OIKAWA, K. 1980. Komgoji kaidzuka, Ugasaki kaidzuka, Ugasaki kofun 1-gō nado. Miyagi ken no kyōiku iinkai (in Japanese).
- OKAMURA, M. 1980. Satohama kaidzuka I. Tōhokurekishihakubutsukan (in Japanese).
- 1986. Satohama kaidzuka V. Tōhokurekishihakubutsukan (in Japanese).
- OTAKE, K. 1983. Jōmonjin wa kossetsu shita ashi de inu o atsukaimasu. *Anima* 121: 11 (in Japanese).
- SAITO, T. 1952. Yoshigo. Yoshikawa-kobunkan (in Japanese).

SATO, M. 1995. Nakazawahama kaidzuka no hakkutsu hōkoku-sho no setsumeikai. Rikuzen - Tkada-shi no kyōiku iinkai (in Japanese).

SATO, T., M. HASHIMOTO, Y. ABE & H. ANDO. In press. Re-discovery of the oldest dog burial remains in Japan. *Anthropological Science*.

SHIBATA, S. 1969. Inu, in *Kachiku no Nihon kodai-shi kenkyū*: 41–70. Gakujutsu (in Japanese).

SHIGEHARA, N. & H. HONGO. 2000. Ancient remains of Jomon dogs from Neolithic sites in Japan, in S.J. Crockford (ed.) *Dogs through time: an archaeological perspective* (British Archaeological Reports international series 889): 61–70. Oxford: British Archaeological Reports.

SUDO, T. 1985. Nakawame kaidzuka II. Tōhokudaigaku ni okeru bungaku no bumon no kōkōgaku-teki kenkyū no tame no kyōkai (in Japanese).

SUGAYA, M. & T. TOIZUMI. 1998. Ningen, inu to buta to no kōhan'na jōmon bochi. Shimomeguro· Ōta Kaidzuka, moharashi, Chiba ken (in Japanese).

SUMIYOSHI, M. 1981. Nishio-shi no Karekinomiya kaidzuka, Aichi ken I. Nishio-shi no kyōiku iinkai (in Japanese).

TAKIGUCHI, H. 1977. Kasori kaidzuka IV. Chuokouronbijutsu (in Japanese).

TOKI, N. 1936. Kanagawa ken no Yamada Nishinoyato kaidzuka, Nakagawa-mura, tsudzukigunde no inu no maisō no hakkutsu. *Senshijidaino jōnanaru* 8: 77–93 (in Japanese).

WATANABE, K. 1966. Terawaki kaidzuka. Iwaki-shi no kyōiku iinkai (in Japanese).

YAWATA, I. & T.K. DAIGAKU. 1973. Kainohana kaizuka. Tokyō kyōiku daigaku bungakubu shigaku hōhōron kyōshitsu (in Japanese).