Shuichi NOSHIRO *, Mutsuhiko MINAKI **, Mitsuo SUZUKI *** and Yayoi UEDA **** : **Vegetation of the Late-Latest Jomon Period at the Inashi-yashiki-ato Site, Saitama Prefecture, Central Japan**

能城修一*・南木睦彦**・鈴木三男***・植田弥生****：**埼玉県北足立郡伊奈氏屋敷跡遺跡における縄文時代後・晩期の植生復元**

Abstract Fossil wood and plant macrofossil assemblages of the Late-Latest Jomon Period discovered at the Inashi-yashiki-ato Site, Saitama Prefecture, were studied and compared. In the fossil wood assemblages obtained from two blocks, *Quercus* sect. *Aegilops* dominated with more than 50% of the assemblage. *Castanea crenata* was also present. In the plant macrofossil assemblages obtained from three blocks, *Quercus* including *Q. serrata* and *Q.* cf. *acutissima* dominated among the arbors. *Wisteria* was also found in two blocks. *Trapa* including *T. incisa* dominated among the herbs. *Scirpus fluviatilis* and *Polygonum maackianum* were also present in one block. Thus, deciduous forests consisting of *Quercus* subgen. *Lepidobalanus* and *Castanea crenata* covered the surrounding uplands during the Late-Latest Jomon Period, and *Trapa* covered the pond surfaces in the lowlands. Dominance of *Q.* sect. *Aegilops* has not previously been detected in the Kanto Plain, and may have charaterized the vegetation in the middle of the Oomiya Upland.
Key words: Fossil woods, Inashi-yashiki-ato Site, Late-Latest Jomon, Plant macrofossils, Saitama Prefecture

要　旨　埼玉県北足立郡伊奈町の伊奈氏屋敷跡遺跡から出土した縄文時代後・晩期の木材化石群および大型植物化石群の種類組成を明らかにした。二つの発掘区から得られた木材化石群では，コナラ属クヌギ節が優占し，50％以上をしめており，それにクリが伴っていた。三つの発掘区から得られた大型植物化石群では，コナラとクヌギ近似種をふくむコナラ属が木本では優占し，草本ではヒメビシをふくむヒシ属が優占した。それに2地区ではフジが，また1地区ではウキヤガラとサデクサが伴っていた。このように遺跡周辺の台地上にはコナラ属コナラ亜属とクリからなる落葉広葉樹林が成立し，低地の池沼は様々なヒシ属植物で覆われていた。コナラ属クヌギ節が優占する化石群が見いだされたのは，関東地方でははじめてであり，大宮台地中央部の特徴であるのかもしれない。
キーワード：伊奈氏屋敷跡遺跡，縄文時代後・晩期，木材化石群，大型植物化石群，埼玉県

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Introduction

Extensive archaeological excavations in lowlands which were begun in the 1980's revealed various fossil wood and plant macrofossil assemblages in the Kanto Plain, including several buried forests (MINAKI & YOSHIKAWA, 1987 ; NOSHIRO & SUZUKI, 1989 ; SUZUKI & NOSHIRO, 1987 ; YOSHIKAWA & MINAKI, 1988 ; etc.). They uncovered the deciduous forests of the Late-Latest Jomon Period that were often dominated by *Fraxinus* in the southern part of this plain. In the Oomiya Upland, these assemblages were only studied at the Juno Peat Bed Site (NOSHIRO & SUZUKI, 1987b ; SUZUKI *et al.*, 1982 ; MURATA, 1982) and the Akayama Site (MINAKI *et al.*, 1987 ; NOSHIRO & SUZUKI, 1987a ; TSUJI, 1989), the former was dominated by *Alnus* and *Castanea crenata* and the latter by *Fraxinus* and *Alnus* during the Late-Latest Jomon Period. The Inashi-yashiki-ato Site is located near the center of the Oomiya Upland, and yielded abundant plant fossils together with Late-Latest Jomon potteries and several wooden artifacts including three dugouts. Among the nine blocks in the lowlands, fossil wood and plant macrofossil assemblages were obtained from three blocks. In the preliminary reports (SUZUKI *et al.*, 1984 ; MINAKI, 1984), fossil woods and plant macrofossils were treated separately, and neither a reconstruction of past vegetation from a comparison between these contemporaneous assemblages or a comparison with the pollen or diatom assemblages (PALYNOSURVEY COMPANY, 1984) was carried out.

Study Site and Stratigraphy

The Inashi-yashiki-ato Site is at Aza Maruyama, Komuro, Ina Machi, Kita-adachi Gun, Saitama Prefecture (35°58' N, 139°37' E), and is in the middle of the Oomiya Upland on the western bank of the

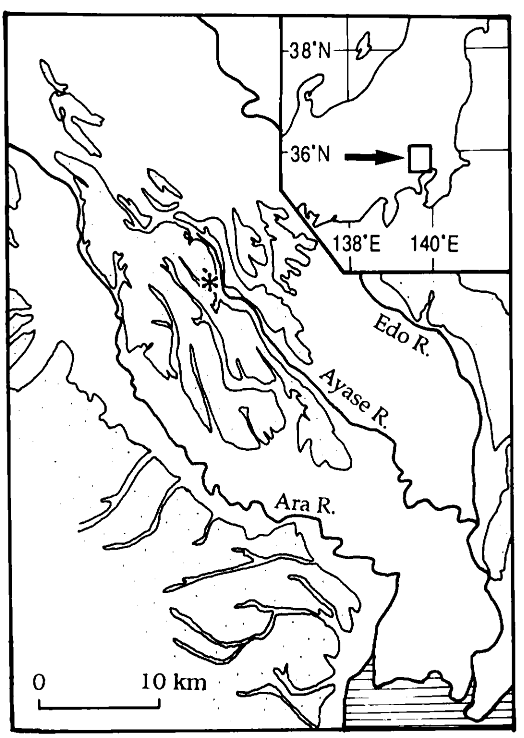

Fig. 1 Location of the Inashi-yashiki-ato Site (asterisk)
Dotted area : upland. White area : lowland.

Continuous Layer	Block I-1	(yBP)	I-4	I-5	Archaeological Remains
		← 2570 ± 60			
Clay No 1	19		15	15	
	40	← 2840 ± 60		20	
Clay No 2	20	← 3270 ± 70	20	21	
		← 3360 ± 80			↑
	42	← 3530 ± 90			Incl. Latest Jomon - Angyo III
	43	← 3790 ± 95	22		
	44	← 3740 ± 95			
Nut Layer	45	← 3760 ± 90	-	-	Late Jomon - Kasori B, Angyo I, II

Fig. 2 Stratigraphy of the Inashi-yashiki-ato Site (modified from MINAKI, 1984)

Ayase River (Fig. 1). Excavation in the lowlands was carried out in nine blocks, and three of them yielded abundant plant fossils. Three blocks in the lowlands were located along the edges of two uplands, about 300 m NS length : I-1 faces the eastern lowlands, and I-4 and I-5 the western lowlands (Fig. 3). The lowlands were at about 8 m a. s. l., and the surrounding uplands about 13 m.

Based on facies changes, layers were separated and numbered downward in respective blocks (Fig. 2). Three continuous layers were uncovered and labeled Clay No. 1, Clay No. 2, and Nut Layer from above. Fossil woods were collected during excavation from layer No. 44 in block I-1, layers No. 20-22 in block I-4, and layer No. 20 in block I-5. Using the wet sieving method, plant macrofossils were obtained from 5-cm-thick consecutive sediments from layers No. 20 to 45 in block I-1, from layer No. 20 and downward in block I-4, and from layer No. 21 and downward in block I-5. In block I-5, specimens were also collected by sight in layer No. 20 during excavation. Except for layer No. 20 in block I-5, all plant fossils were obtained between Clay No. 2 and the Nut Layer. Radiocarbon ages of these layers range between 2840 and 3790 y. B. P., and correspond with the coexisting archaeological remains of the Late to Latest Jomon Period, i. e., Kasori E and Angyo I-III potteries. The plant fossil assemblages can, therefore, be regarded as those of the Late-Latest Jomon Period.

Results

Fossil wood

Among the 1074 samples in total, 19 taxa were identified with rootwoods in two taxa : one taxa in block I-1, seven taxa among 260 samples in block I-4, and 18 taxa among 813 samples in block I- 5 (Table 1 ; Fig. 3). Except for two conifers, *Quercus* subgen. *Cyclobalanopsis,* and *Rosa,* all taxa were deciduous broad-leaved. *Q.* sect. *Aegilops* (50.4% in block I-4 ; 69.6% in block I-5) dominated in blocks I-4 and I-5 with more than half of the specimens. *Castanea crenata* (35.0% ; 12.1%) was also present as were *Prunus* (5.8%), *Q.* subgen. *Cyclobalanopsis* (3.8%), *Q.* sect. *Prinus* (3.1%), and *Morus bombycis* (1.5%) in block I-4, and *Salix* (4.8%), *Wisteria floribunda* (3.6%), *Q.* sect. *Prinus* (3.1%), *Celtis* (1.6%), *Zelkova serrata* (1.5%), and *Q.* subgen. *Cyclobalanopsis* (1.4%) in block I-5. Thus, deciduous forests dominated by *Q.* sect. *Aegilops* and *Castanea crenata* covered the surrounding uplands in the Late-Latest Jomon Period, and *Q.* subgen. *Cyclobalanopsis* could also be found. The existence of

Table 1 Fossil wood assemblages of the Inashi-yashiki-ato Site (modified from SUZUKI *et al.*, 1984)

Taxon Block	I-1	I-4		I-5	
Layer	44	20-22	%	20	%
Torreya nucifera				1	0.1%
Cephalotaxus harringtonia				1	0.1%
Salix				39	4.8%
Quercus sect. Aegilops S	1	126	48.5%	530	65.2%
Q. sect. Aegilops R		5	1.9%	36	4.4%
Q. sect. Prinus		8	3.1%	25	3.1%
Q. subgen. Cyclobalanopsis S		10	3.8%	5	0.6%
Q. subgen. Cyclobalanopsis R				6	0.7%
Castanea crenata		91	35.0%	98	12.1%
Zelkova serrata				12	1.5%
Celtis				13	1.6%
Aphananthe aspera				1	0.1%
Morus bombycis		4	1.5%	5	0.6%
Rosa				3	0.4%
Prunus		15	5.8%		
Albizia julibrissin				2	0.2%
Wisteria floribunda		1	0.4%	29	3.6%
Melia azedarach				1	0.1%
Rhus javanica				1	0.1%
Sapindus mukorossi				3	0.4%
Fraxinus				2	0.2%
Total	1	260		813	

S: stemwood, R: rootwood.

rootwoods from *Q.* sect. *Aegilops* and subgen. *Cyclobalanopsis* suggests their growth near the lowland, but their spatial distribution was not studied. Though outside the northern limit of its present distribution (KURATA, 1964), *Sapindus mukorossi* was common during this period in the southern part of this plain (SUZUKI & NOSHIRO, 1987). *Melia azedarach* has never been found this far north in this plain.

Plant macrofossil

In the three blocks, 52 taxa were identified : 41 among 1367 specimens in block I-1, 20 among 425 specimens in block I-4, and 29 among 2481 specimens in block I-5 (Table 2 ; Fig. 3). Herbaceous taxa made up three fourths of the specimens in block I-1, one third in block I-4, and one half in block I-5. For arbors, the dominant taxa were *Quercus* including *Q. serrata* (18.8%), and *Wisteria* (4.7%) in block I- 1, *Quercus* including *Q.* cf. *acutissima* (64.2%) in block I-4, and *Quercus* including *Q. serrata* (31.4%) and *Wisteria* (20.4%) in block I-5. No specimens of *Q.* subgen. *Cyclobalanopsis* were identified. For herbs, *Trapa* dominated in every block, 48.6% in block I-1, 82.1% in block I-4, and 44.5% in block I-5. *Scirpus fluviatilis* (11.7%) and *Polygonum maackianum* (7.6%) in block I-1, and *Euryale ferox* in blocks I-4 (1.9%) and I-5 (1.7%) were also present.

In the lowlands, the composition of herbaceous taxa seems to have changed, toward the upper horizon, from *Trapa*-dominant assemblages in the lacustrine environment to *Scirpus fluviatilis*-*Polygonum maackianum*-dominant ones in marshes according to the results obtained at grid 4 C-1 in

Table 2 Plant macrofossil assemblages of the Inashi-yashiki-ato Site (modified from MINAKI 1984)
Percentage is based on the total number of specimens.

Taxon	Block	I-1		I-4		I-5					
	Layer	20-45	%	20-22-	%	20	%	21-	%	Total	%
arbor	(part)										
Cephalotaxus harringtonia	S							2	0.1%	2	0.1%
Juglans ailanthifolia	E	1	0.1%	3	0.7%	7	3.4%			7	0.3%
Carpinus tschonoskii	F	5	0.4%					1	0.0%	1	0.0%
Ostrya japonica	F	27	2.0%								
Corylus heterophylla	F					2	1.0%			2	0.1%
Quercus serrata	C YC	51	3.7%			11	5.3%	627	27.6%	638	25.7%
Q. aliena	C					1	0.5%	1	0.0%	2	0.1%
Q. cf. acutissima	N YC YN	5	0.4%	162	38.1%	27	13.0%	9	0.4%	36	1.5%
Q.	C N B	201	14.7%	111	26.1%	4	1.9%	100	4.4%	104	4.2%
Castanea crenata	N Sp	5	0.4%	7	1.6%	6	2.9%	7	0.3%	13	0.5%
Morus bombycis	S	1	0.1%								
Lindera cf. umbellata	S	14	1.0%								
Rubus	E							1	0.0%	1	0.0%
Prunus sect. Pseudocerasus	E	2	0.1%								
Wisteria	B	64	4.7%	6	1.4%			507	22.3%	507	20.4%
Leguminosae	F	2	0.1%					1	0.0%	1	0.0%
Zanthoxylum ailanthoides	S	1	0.1%					1	0.0%	1	0.0%
Phellodendron amurense	S	2	0.1%	3	0.7%						
Mallotus japonicus	S	8	0.6%	3	0.7%			2	0.1%	2	0.1%
Acer mono	FS	2	0.1%								
A. cf. diabolicum	F	1	0.1%								
Aesculus turbinata	S	1	0.1%	2	0.5%	1	0.5%			1	0.0%
Sapindus mukorossi	S			4	0.9%	1	0.5%	3	0.1%	4	0.2%
Berchemia	E	6	0.4%								
Vitis	S			1	0.2%						
Cornus controversa	E	3	0.2%					1	0.0%	1	0.0%
C. brachypoda	E			6	1.4%			3	0.1%	3	0.1%
arbor total		402	29.4%	308	72.5%	60	28.8%	1266	55.7%	1326	53.4%
herb	(part)										
Potamogeton	F			2	0.5%						
Cyperus	F	1	0.1%	4	0.9%			2	0.1%	2	0.1%
Scirpus fluviatilis	F	160	11.7%	3	0.7%			2	0.1%	2	0.1%
Scirpus sp. A & B	F	13	1.0%	1	0.2%						
Dioscorea japonica	S	1	0.1%								
Polygonum perfoliatum	F	4	0.3%								
P. maackianum	F	104	7.6%	2	0.5%			3	0.1%	3	0.1%
P. scabrum	F	4	0.3%								
P. pubescens	F	3	0.2%								
P. cf. hyaropiper	F	2	0.1%								
P. sp. A, B & C	F	1	0.1%	1	0.2%						
Euryale ferox	S	1	0.1%	8	1.9%	8	3.8%	35	1.5%	43	1.7%
Nuphar	S	1	0.1%								
Ceratophyllum demersum*	S	1	0.1%					2	0.1%	2	0.1%
Trapa japonica	F	1	0.1%			16	7.7%	6	0.3%	22	0.9%
T. japonica var. rubeola	F	1	0.1%					1	0.0%	1	0.0%
T. matsumotoi	F	2	0.1%			7	3.4%			7	0.3%
T. sp. A & B	F	33	2.4%	1	0.2%	61	29.3%	23	1.0%	84	3.4%
T. excl. T. incisa	F	475	34.7%	93	21.9%	53	25.5%	792	34.8%	845	34.1%
T. incisa	F	153	11.2%	2	0.5%	3	1.4%	141	6.2%	144	5.8%
Trapella sinensis		2	0.1%								
Actinostemma lobatum	S	2	0.1%								
herb total		965	70.6%	117	27.5%	148	71.2%	1007	44.3%	1155	46.6%
Total		1367		425		208		2273		2481	

* incl. var. quadrispinum
B: bud, C: cupule, E: endocarp (stone), F: fruit, FS: fruit & seed, N: nut,
S: seed, Sp: cupular spine, YC: young cupule, YN: young nut.

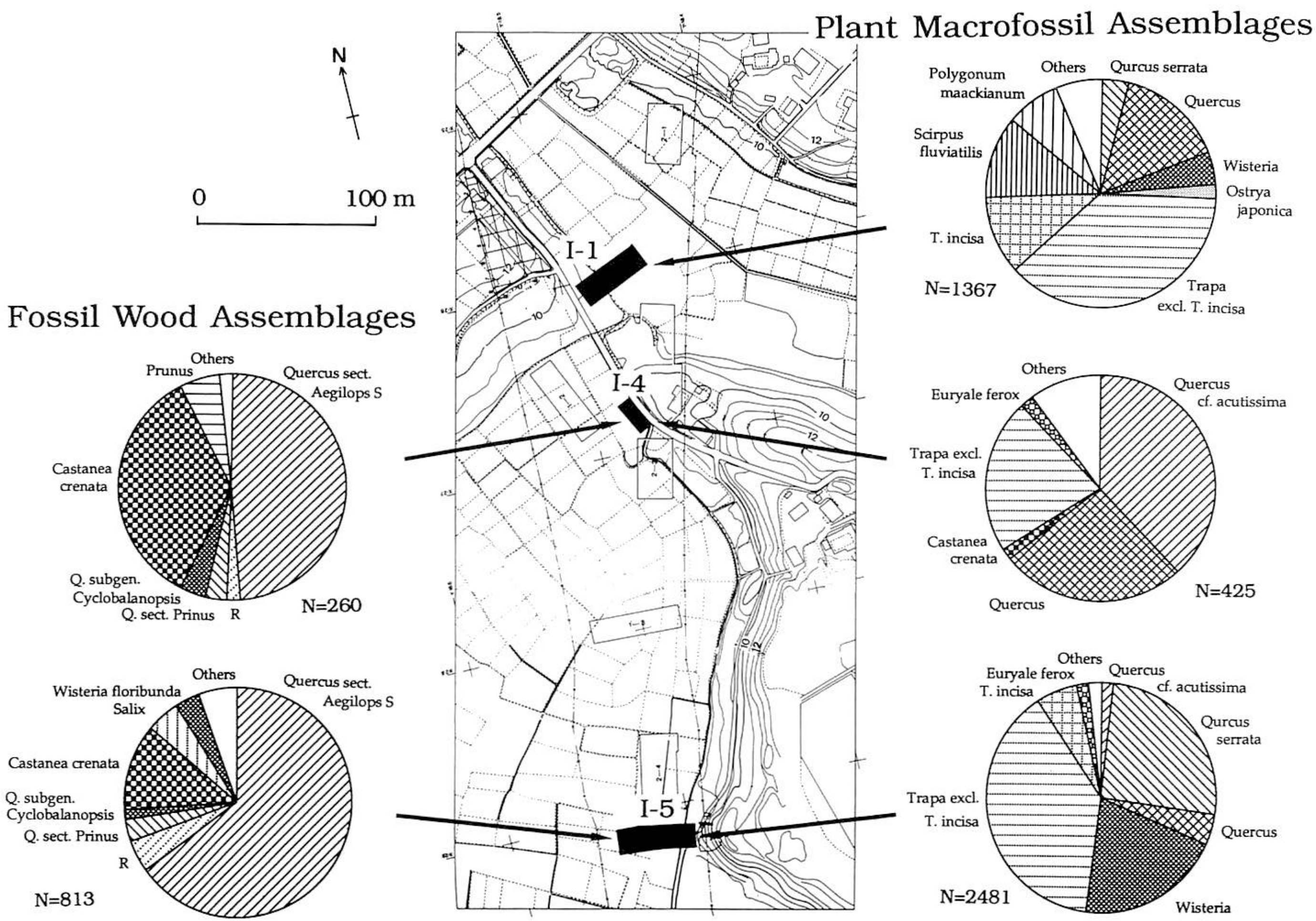

Fig. 3 Comparison of fossil wood assemblages and plant macrofossil assemblages at the Inashi-yashiki-ato Site (map by AOKI *et al.*, 1984)

block I-1. On the other hand, in layer No. 20 of block I-5, percentages of *Trapa* increased (Table 2). In the uplands, forest vegetation consisted mostly of *Quercus serrata* and *Q.* cf. *acutissima* without any floristic changes through these periods, and evergreen broad-leaved taxa were not found in the plant macrofossils. In block I-5, *Q. serrata* dominated below layer No. 21 and *Q.* cf. *acutissima* did in layer No. 20, but this change was not present in the other blocks.

Trapa specimens recovered at this site included various forms and were one of the most variable assemblages within a study site. Some could be identified as the extinct *T. matsumotoi* (MAEKAWA, 1952). Two other types, sp. A and B, that were quite similar to each other except for the position and orientation of their upper horns, could not, however, be assigned to any taxa so far described (MINAKI, 1984).

Quercus aliena, which is not distributed in the Kanto Plain at present (KURATA, 1971), seems to have been common during the Jomon Period, and was also recorded at the Fukuro-teichi Site, Kita-ku, Tokyo (YOSHIKAWA & MINAKI, 1988), and the Tama New Town No. 796 Site, Hachioji, Tokyo (TSUJI *et al.*, 1986).

Comparison between fossil woods and plant macrofossils

In blocks I-4 and I-5, both fossil wood and plant macrofossil assemblages were obtained. In block I-4, the dominance of *Quercus* sect. *Aegilops* and *Castanea crenata* in fossil woods corresponded to that of *Quercus* cf. *acutissima* and the actual occurrence of *Castanea crenata* in the plant macrofossils (Fig. 3). *Q.* subgen. *Cyclobalanopsis* and *Prunus* in the fossil woods, however, were not present in the plant macrofossils. In block I-5, the same dominance persisted in the fossil woods as in block I-4, but *Q. serrata* specimens outnumbered *Q.* cf. *acutissima* in the plant macrofossils. This was probably due to the dominance of *Q. serrata* in the lower horizon, and that of *Q.* cf. *acutissima* in the uppermost layer No. 20 (Table 2). The percentage of *Q.* cf. *acutissima* in layer No. 20 was low compared with the fossil woods and that of block I-4, and may have been biased by the sampling method. The frequency of *Castanea crenata* was generally more marked in the fossil wood assemblages than in the plant macrofossils, and may have been strongly biased by low productivity of young fruit, bad preservation, or difficulty in identifying fragments.

Discussion

Deciduous forests dominated by *Quercus* cf. *acutissima* and *Q. serrata* prevailed in the uplands around the Inashi-yashiki-ato Site during the Late-Latest Jomon Period, and *Trapa* covered the pond surfaces around the uplands.

In the pollen assemblages of block I-1, *Quercus* subgen. *Lepidobalanus* dominated through these periods, accompanied by *Cryptomeria, Celtis-Aphananthe, Q.* subgen. *Cyclobalanopsis, Carpinus-Ostrya* and *Ulmus-Zelkova* (PALYNOSURVEY COMPANY, 1984). This mostly corresponded with the fossil wood and plant macrofossil assemblages, and confirmed the prevalence of deciduous forests around this site. An increase of *Cryptomeria* was also detected at the Akayama Site (TSUJI, 1989) and Nazukari, Nagareyama City, Chiba Prefecture (ENDO *et al.*, 1989), but its existence around this site, however, is doubtful. Its pollen may have been derived from the Kanto Mountains to the west. In the diatom assemblages of block I-1, lacustrine taxa, i. e., *Fragilaria construens* and *Melosira italica,* prevailed in layer No. 45-40, and were replaced by marshy ones, i. e., *Eunotia tenella,* in layer No. 20 (PALYNOSURVEY COMPANY, 1984). This result agrees with the changes in herbaceous taxa among the plant macrofossils in block I-1, and confirmed the environmental changes in the lowland.

The prevalence of deciduous forests was identical with the results obtained in the southern part of this plain, but *Fraxinus* was the dominant taxa of those forests, usually occupying 20-40% (SUZUKI & NOSHIRO, 1987). Except for the Juno Peat Bed Site, frequent occurrence of *Castanea crenata* has not been detected at any study sites in the southern part, and seems to characterize deciduous forests in the middle of the Oomiya Upland. This combination of *Quercus acutissima* and *Castanea crenata* characterizes present secondary forests of this plain, but it is doubtful whether severe human utilization of forest resources during the Jomon Period led to such composition because floristic composition was rich compared with present secondary forests.

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References

AOKI, M., MIZUMURA, T. & SAKAI, S. 1984. Inashi-yashiki-ato Site. "Akabane-Inashi-yashiki-ato, Tohoku Shinkansen Archaeological Report II" (ed. Saitama Prefectural Archaeological Research Center), 43-188. Saitama Prefectural Archaeological Research Center, Saitama (in Japanese).

ENDO, K., KOSUGI, M., MATSUSHITA, M., MIYAJI, N., HISHIDA, R. & TAKANO, T. 1989. Holocene environmental history in and around the Paleo-Nagareyama Bay, central Kanto Plain. Quat. Res. (Tokyo), 28 : 61−77 (in Japaese).

KURATA, S. 1964. Illustrated Important Forest Trees of Japan. 220 pp. Chikyu Shuppan, Tokyo.

———. 1971. Illustrated Important Forest Trees of Japan, vol. 3. 260 pp. Chikyu Shuppan, Tokyo.

MAEKAWA, F. 1952. Small plant remains from the Kamo Site. "Kamo Site", Keio University Report of Archaeology and Ethnology, No. 1 : 125−130 (in Japanese).

MINAKI, M. 1984. Plant macrofossils of the Inashi-yashiki-ato Site. "Akabane-Inashi-yashiki-ato, Tohoku Shinkansen Archaeological Report II" (ed. Saitama Prefectural Archaeological Research Center), 203−212, pls. 58−63, table 1. Saitama Prefectural Archaeological Research Center, Saitama (in Japanese).

——— & YOSHIKAWA, J. 1987. Plant macrofossils since the Jomon Period at the Nakazato Site, Tokyo. "Nakazato Site, vol. 2, Site and Paleoenvironment 2" (ed. Nakazato Site Research Group), 101−183. Nakazato Site Research Group, Tokyo (in Japanese).

———, ———, YOSHIKAWA, J. & YANO, Y. 1987. Plant macrofossils of the Akayama Site, Japan. "Akayama-Paleoenvironment" (ed. Archaeological Site Research Group of Kawaguchi City), 131−202.(in Japanese).

MURATA, J. 1982. Seeds. "Report of the Juno Peat Bed Site-Natural Relics" (ed. Saitama Prefectural Museum), 287−298, pls. 44−48. Saitama Education Board, Saitama (in Japanese).

NOSHIRO, S. & SUZUKI, M. 1987a. Fossil wood association excavated from the Akayama Site, Kawaguchi City, Saitama Prefecture. "Akayama-Paleoenvironmen" (ed. Archaeological Site Research Group of Kawaguchi City), 203−280 (in Japanese).

——— & ———. 1987b. What do the fossil wood assemblages tell us ? Jpn. J. Histor. Bot., No. 2 : 13−25 (in Japanese).

——— & ———. 1989. Forest reconstruction from fossil wood assemblages in prehistory. Quat. Res. (Tokyo), 27 : 313−329.

PALYNOSURVEY COMPANY. 1984. Pollen and diatom analysis of the Inashi-yashiki-ato Site. "Akabane -Inashi-yashiki-ato, Tohoku Shinkansen Archaeological Report II" (ed. Saitama Prefectural Archaeological Research Center), 213−223, table 2-5. Saitama Prefectural Archaeological Research Center, Saitama (in Japanese).

SUZUKI, M. & NOSHIRO, S. 1987. Fossil wood flora and its change in Kanto plain from Jomon to Kofun periods. Acta Phytotax. Geobot., 38 : 260−274 (in Japanese).

———, ——— & UEDA, Y. 1982. Trees. "Report of the Juno Peat Bed Site-Natural Relics" (ed. Saitama Prefectural Museum), 261－282, pls. 26－39. Saitama Education Board, Saitama (in Japanese).

———, ——— & ———. 1984. Arboreal taxa excavated from the Inashi-yashiki- ato Site. "Akabane-Inashi-yashiki-ato, Tohoku Shinkansen Archaeological Report II" (ed. Saitama Prefectural Archaeological Research Center), 189－201, pls. 44－57. Saitama Prefectural Archaeological Research Center, Saitama (in Japanese).

TSUJI, S. 1989. Paleoenvironmental reconstruction in the dissected valley in prehistory : Holocene paleoenvironment at the Akayama Site in Kawaguchi, central Kanto Plain, Japan. Quat. Res. (Tokyo), 27 : 331－356 (in Japanese).

———, MINAKI, M., SUZUKI, M., NOSHIRO, S., & CHINO, Y. 1986. Stratigraphy and plant fossil assemblages of the peat bed of the Jomon Period. "Tama New Town Site-1984" (ed. Tokyo Metropolitan Archaeological Center), No. 3 : 72－116, pls. 35－64. Tokyo Metropolitan Archaeological Center, Tokyo (in Japanese).

YOSHIKAWA, J. & MINAKI, M. 1988. Plant macrofossils at the Fukuro-teichi Site, Kita-ku, Tokyo. "Fukuro-teichi Site, Natural History 1" (ed. Tohoku Shinkansen Akabane Block Research Group), 405－436. Tohoku Shinkansen Akabane Block Research Group & East Japan Railway Company, Tokyo (in Japanese).

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本書は，ヨーロッパ産の木本植物 1150 種のうち 602 種について，光学顕微鏡写真と簡潔な記載とを示した木材図鑑である。原文は独文とその英訳とが，同一ページに併記してあり，独文の不得手なものにも理解できる。構成は，基本的に見開きの 2 ページで 1 種あるいは 2 種を扱うようになっており，左ページに顕微鏡写真が，そして右ページにその記載がくる。また記載の下にはそれぞれの種の分布図も示されている。扱われているのは，針葉樹と単子葉植物がそれぞれ 4 科，双子葉植物が 75 科であり，ヨーロッパ産のすべての科が網羅されている。マメ科やシソ科，バラ科といった大きな科では，平均して全種数の 35%ほどの種を取り上げて，科内の変異の幅を表現し，また小さな科では全種数の 70%ほどを扱っているそうだ。顕微鏡写真は木材組織の変異を記述すべく，1 ページ 1 種のものでは横断面 4, 5 枚，接線断面 2 枚，放射断面 3 枚など，各断面について複数の写真が示してあり，木材構造の可塑性をしるうえで大変参考になる。これは，一般の図鑑が一標本の 3 断面の写真を示して，その種の形質を代表させていることから考えると，ひじょうに良心的な表現である。著者はこれらの標本を，1972 年から 1983 年までの 12 年間にわたって自身で採集し，切片作製まで行なったそうで，その情熱には頭が下がる。残念に思えるのは，これだけの変異が示されているにも関わらず，それらの標本の採集データが示されていないことである。著者が生育地による木材構造の変異に関心があるだけに，読者の側でも産地あるいは生育状況をあたまに描きながら写真を眺めることができるように構成すべきであっただろう。また写真が多数載せられているのに反し，記載は同定に必要な十分なものに限られていて，きわめて簡単である。道管の直径とか放射組織の大きさといった量的な形質はまったく扱われておらず，これだけの樹種を扱ったのであるから，これらの形質のうちのいくつかは基礎データとして提示すべきではなかったであろうか。この点で，この図鑑は文章による記載よりは写真による表現に重きが置かれていると言える。630 ページにわたる記載の部分をはさみ，前には形質の定義と，40 ページをこえる検索表がある。形質の定義は左ページに顕微鏡写真，右ページにその解説となっており分かりやすい。記載の後には Pieter BAAS による木材構造の生態的適応についての論説が載る。これら文章の部分はすべてドットプリンターによる出力を印刷したもので，ドットが荒いのが玉に瑕である。いずれにしても，これだけの温帯樹種を，変異まで考慮して扱った木材図鑑はこれまでになく，日本産の木材を同定する際にも大変参考になる。とくに潅木類や蔓植物を精力的に取り入れており，高木とちがって，木材資源としてこれまであまり注目されてこなかったこうした樹木の写真および記載は，大変貴重な情報である。 (能城修一)