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Long-term Trends in Food Habits of the Raccoon Dog, *Nyctereutes viverrinus*, in the Imperial Palace, Tokyo

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Abstract The food habits of the raccoon dogs in the Imperial Palace were examined by fecal analysis focused on the long term trend for five years. A total of 95 taxa (including 58 taxa identified as genera or species) of plant seeds were detected from 163 collected feces in 164 weekly surveys. Among them, eight taxa were selected as the food resources for the raccoon dogs in the Imperial Palace. The intakes of these taxa showed seasonal succession, i.e. *Aphananthe aspera* in January, *Idesia polycarpa* in February, *Rubus hirsutus* from May to July, *Cerasus* spp. in May and June, *Morus* spp. in June, *Machilus thunbergii* in July and August, *Aphananthe aspera* from September to December until the following January, and also *Ficus erecta* in September and *Celtis sinensis* in December. In March and April, plant harvest is rather poor, and therefore raccoon dogs feed on the inside endosperm of *Ginkgo biloba* and family Fagaceae to supply the insufficient nutrients as observed by broken seed coats from feces. These spring foods were further supplemented by the animal food resources shown by additional studies from June 2010 to December 2013. These trends in the main food habits were almost consistent during five years, and thus it is considered that the stable food supply enables maintenance of the population of the raccoon dogs in the Imperial Palace.
Key words: fecal analysis, food habits, raccoon dog, the Imperial Palace.

Introduction

The raccoon dog, *Nyctereutes viverrinus*, is an endemic species of canid carnivore distributed all around Japan excepting Hokkaido and Okinawa Prefecture (Ikeda, 1991; Kim *et al.*, 2015). Though there are some capture records of this species in the Tokyo metropolitan area until the 1950's, its distribution had shrunk beyond in the western part of Tokyo in the 1970's because of the progress of urbanization in those decades (Obara, 1982). However, reports of this species in the Tokyo Metropolis have recently increased dramatically. Raccoon dogs in the Imperial Palace have been reported by the imperial guards from the middle of the 1990's, and later estimated to be settled based on the biological surveys of Imperial Palace from 1996 to 2000 (Endo *et al.*, 2000). Recent study confirmed the reproduction of the raccoon dog and several individuals inhabited this area exclusively owing to having their home ranges in the Imperial Palace (Kawada *et al.*, 2014).

The raccoon dog tends to defecate at a certain location in its home range called a latrine. Sako *et al.* (2008) examined the food habits of this species based on fecal analysis with hand sorting method of feces collected in the Imperial Palace since April, 2006 to December, 2007, and concluded that the raccoon dogs in this area forage on natural resources available in this area, mainly nuts and fruits or insects. Moreover, the foraging trends of several fruits as a main food content in certain months were related to the fruiting period of the respective plant species. However, further study over a longer period is awaited to certify if these results were transient or a stable peculiarity for the raccoon dogs in the Imperial Palace.

The fecal analysis of the food habits is beneficial due to the aspects of less physical effect and relative ease of collecting feces (Koike, 2013). Recent advances on the food habits of carnivores showed that their foraging on some kinds of fruits contributes to seed dispersal (Koike and Masaki, 2008; Koike *et al.*, 2008), and the seasonal and annual variations of the plant food resources, e.g. in the Asiatic black bear, *Ursus thibetanus*, have been reported based on long term researches (Koike, 2010). Studies on the food habits of the raccoon dog concerning fruit intake have been done by Miyata *et al.* (1989) and Sakamoto and Takatsuki (2015), but long term studies have not been applied.

We have conducted hand sorting fecal analysis of the raccoon dogs in the Imperial Palace for five years from 2009 to 2013 for the further understanding of the fluctuations of fruits usage for foods. A similar short study has already been published elsewhere (Sako *et al.*, 2008). The sampling location of feces was restricted to only one latrine, which was one of the sampling locations in the previous research. This study focused on the succession of the food habits and the usage of the latrine in the long term.

Materials and methods

1. Study site

The Imperial Palace is a large green space with a total area of 115 ha located at the center of Chiyoda-ku, Tokyo Metropolis. The west part of the Imperial Palace is called the Fukiage Gardens where there is deep forest with evergreen broad leaf trees and deciduous broad leaf trees (Konta *et al.*, 2000). According to each tree survey in this area, there were 133 large trees confirmed, of which the most dominant was *Castanopsis sieboldii* followed by *Aphananthe aspera*, *Ginkgo biloba*, *Zelkova serrata* and *Quercus acuta* (Gardens Division, Maintenance and Works Department, Imperial Household Agency, 2009). The study site was one of the latrines in the Fukiage Gardens studied by Sako *et al.* (2008) which was denoted "A1" (Fig. 1). The flora around A1 represents *Machilus thunbergii*, *Ginkgo biloba*, *Aphananthe aspera*, *Idesia polycarpa*, *Eurya japonica* and others as the canopy layer, *Hydrangea macrophylla*, *Fatsia japonica*, *Aucuba japonica*, *Ficus erecta* and others as the shrub layer, and *Hedera rhombea*, *Rubus hirsutus*, *Sasa veitchii* and others as the herbaceous layer (Gardens Division, Maintenance and Works Department, Imperial Household Agency, 2009). In the Fukiage Gardens, it was estimated that several raccoon dogs were living and A1 is thought to be a location included in the home ranges of these individuals (Kawada *et al.*, 2014). More detailed environmental notes were described elsewhere (e.g. Sako *et al.*, 2008).

2. Study methods

From January, 2009 to December, 2013, we collected the freshest feces of a raccoon dog, considered to have been excreted after the last sampling, at 2 pm every Sunday. If we decided that a raccoon dog did not excrete any feces within a week, sampling was not done. The feces were washed with 0.5 mm mesh, and then the included plant seeds were identified and counted. The number of seeds was recorded as "1" to "10" pieces or "＞10" pieces if the number was less than 11 or more than 10, respectively.

Because of the omnivorous nature of the raccoon dog, consideration of the food materials other than plants need to be evaluated, notwithstanding our focus on the fruits eaten by this species. Therefore, after having recorded seeds, fecal contents were additionally identified and quantified according to Sako *et al.* (2008) from June 2010 to December 2013. An index of each detected food material to discuss the seasonal variation of food habits was calculated by fol-

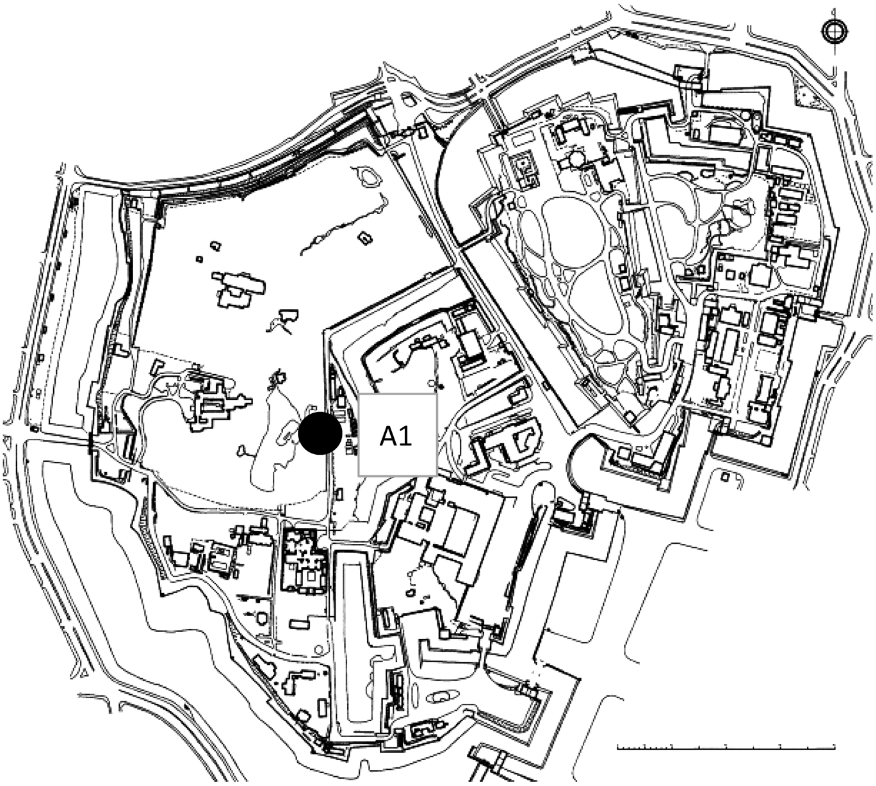

Fig. 1. Study site and the latrine “A1” where we collected the freshest feces of a raccoon dog. Bar indicates 400 m.

lowing formula:

Detection ratio (%) = number of feces including each material / examined feces × 100

Results

1. Trends in plant seeds from feces

We collected 164 feces in the 261 weekly surveys from January 2009 to December 2013. The number of collected feces was fewer from March to August, and increased from October to December (Table 1). There was seldom available sampling from March to August in 2009, 2010 and 2012. We could not collect any feces in March, April, June and August of 2011 or in the five months from April to August of 2013. Therefore, the rates of collected feces were varied between 44 to 79% during the five years (Table 2).

Among 164 analyzed feces, we detected plant seeds from 163 feces (99% of collected feces) (Table 1) and one feces collected in April 12, 2009 had no seeds.

These seeds were classified into 95 taxa which included 58 taxa identified down to genera or species (Appendix 1-5); thus the feces of the raccoon dogs contained highly diversified plant materials. Some parts of these seeds detected were considered to include accidental intake during the foraging of animal materials, e.g. insects or chilopods. Therefore, seeds which only one appearance in total survey were rejected, and 35 taxa were selected to represent the main plant food resources of the raccoon dogs in the Imperial Palace (Table 3). Most of these seeds were from fleshy and juicy fruits when they were ripe enough. On the other hand, a large amount of broken seed coats of *Ginkgo biloba*, family Fagaceae and family Ebenaceae were found per feces in several weeks, but we could not count the number of their seeds (see below).

Table 1. Collection data of feces and detected seeds from feces.

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Number of surveys	23	20	22	21	23	21	22	22	22	22	21	22	261
Number of feces	19	16	8	6	11	9	12	6	17	21	20	19	164
(%)	(83)	(80)	(36)	(29)	(48)	(43)	(55)	(27)	(77)	(95)	(95)	(86)	(63)
Plant seeds from feces	19	16	8	5	11	9	12	6	17	21	20	19	163
(%)	(100)	(100)	(100)	(83)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(99)

Table 2. Collection data of feces in each year.

Year	2009	2010	2011	2012	2013	Total
Number of surveys	52	52	52	53	52	261
Number of feces	41	32	23	42	26	164
(%)	(79)	(62)	(44)	(79)	(50)	(63)

Table 3. The taxa from which more than one seed was detected in all collected feces.

Plant taxa	Number of cases	Total of seeds
Aphananthe aspera	104	>953
Rubus hirsutus	47	>262
Celtis sinensis	39	>235
Ficus erecta	26	>181
Idesia polycarpa	66	>180
Machilus thunbergii	20	>157
Morus spp.	10	>88
Cerasus spp.	10	>59
Diospyros lotus	8	33
Polygonum longisetum	9	22
Ginkgo biloba	7	19
Oxalis corniculata	13	17
Liriope muscari	6	14
Cornus controversa	6	12
Stellaria neglecta	6	10
Delphinium anthriscifolium	5	9
Akebia quinata	6	8
Hovenia dulcis	3	8
Cornus kousa	2	8
Eurya japonica	2	8
Trifolium dubium	5	7
Potentilla freyniana	4	7
Achyranthes bidentata var. *japonica*	3	7
Oplismenus undulatifolius	5	6
Potentilla spp.	4	5
Stellaria aquatica	3	4
Diospyros kaki	2	4
Echinochloa spp.	3	3
Stellaria spp.	3	3
Ligustrum japonicum	2	3
Ajuga decumbens	2	3
Houttuynia cordata	2	2
Disporum smilacinum	2	2
Albizia julibrissin	2	2
Carpinus laxiflora	2	2

Seeds of the folloing eight taxa, *Aphananthe aspera*, *Celtis sinensis*, *Rubus hirsutus*, *Cerasus* spp., *Morus* spp., *Machilus thunbergii*, *Ficus erecta*, and *Idesia polycarpa*, were detected in the number of more than 10 seeds per feces at least once, as shown in Table 4. Seeds of *Aphananthe aspera* were most frequently detected in the number of more than 10 seeds from September to December and after January they decreased in number of seeds per feces and some were detected until February. *Celtis sinensis* showed the fluctuation among years but was continuously detected from January to March, 2012 and in December, 2013. *Rubus hirsutus* was detected from May to July, and especially abundant seeds were detected in the short period from late May to early June. *Cerasus* spp. were detected in May and June; however, it was not stable because of the blank period of collecting feces in 2012 and 2013. A similar situation was seen in *Morus* spp. which were found in late May to June, and only one feces was collected in April 12 among the surveys in 2009. *Machilus thunbergii* was detected in July and August; also small amounts of this species were found in September, 2012. *Ficus erecta* was detected from late August to October. *Idesia polycarpa* tended to be detected frequently in February with some other seeds, and only one feces collected in July 11, 2010 included more than 10 seeds of *Idesia polycarpa*. From March to April, coinciding to the tenth to seventeenth weeks, every taxon of seeds was less frequently detected.

Based on the compiled data of monthly seed appearances, the sequence of the detection ratio for main plant food resources were as follows: *Aphananthe aspera* in January (84%), *Idesia polycarpa* in February (69%), *Rubus hirsutus*

Table 4. Data set of 8 selected plant taxa detected from feces. The shaded cells indicate the days when we did not collect feces. Vertical lines mean boundaries between months.

Taxon	Year	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Month			Jan.					Feb.				Mar.				Apr.				May					Jun.		
Aphananthe aspera	2009		4	>10	>10	1						7												1			
	2010	>10	>10	>10		>10	>10	8		1																	
	2011	1		6				>10																			
	2012	1	5	3		>10	>10	>10	>10	>10															2		
	2013		6	2	8		1																				
Celtis sinensis	2009																										
	2010																										
	2011																										
	2012	>10	10	>10	>10	>10	>10	>10	8	>10	2				4												
	2013																										
Rubus hirsutus	2009																		>10	>10	>10	>10	>10		>10	8	3
	2010							1		1										>10		>10		>10	>10		
	2011																					>10	>10				
	2012								1			1												10	5	>10	
	2013																										
Cerasus spp.	2009																					>10	3	1			
	2010																							9	>10		
	2011																						>10				
	2012																				1					1	
	2013																										
Morus spp.	2009																					>10	>10	>10	>10	6	
	2010																								>10		
	2011																						>10				
	2012																							3		>10	
	2013																										
Machilus thunbergii	2009																									2	>10
	2010																										
	2011																										
	2012																										
	2013																										
Ficus erecta	2009																										
	2010					7		3							2												
	2011																										
	2012																										
	2013																										
Idesia polycarpa	2009								5			1								1			2				
	2010		2			9		3		5	3				8	2				2					2		
	2011	3		2				2																			
	2012	1				1	1	4	5	6	1	4	3			3					5			2	1	10	
	2013	1	2		2		1	2	1																		

Taxon	Year	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Month			Jul.				Aug.					Sep.				Oct.				Nov.					Dec.			
Aphananthe aspera	2009										>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	9	>10	>10	
	2010		1											>10	>10	>10	>10	>10			10	>10	>10		>10	>10	6	
	2011			2									>10	>10	>10	>10	>10	>10	6	>10	>10	>10	>10	>10	6		2	
	2012												3	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	6	>10		
	2013									>10	>10		>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	1	8	
Celtis sinensis	2009						3									1				1			7	>10	2	4	5	
	2010													3	1										1			
	2011					4								1		9			1	10		4	>10				2	
	2012																											
	2013									1	1								2	2	2		>10	>10	>10		>10	
Rubus hirsutus	2009	2																									1	
	2010	10	>10	6		4							>10	1														
	2011			>10	5	1							1			2		2										
	2012		5	2	4							2	3				1											
	2013												1					1	1						1			
Cerasus spp.	2009																											
	2010	1	9										2															
	2011																											
	2012																											
	2013																											
Morus spp.	2009																											
	2010		2																									
	2011																											
	2012																											
	2013																											
Machilus thunbergii	2009	>10			8	>10	3																					
	2010		>10	>10		>10																						
	2011			>10																								
	2012		8	>10	>10	>10		>10		2	6	4	2	1														
	2013																											
Ficus erecta	2009					1					>10	>10	10															
	2010		2																									
	2011												>10	2	>10	3												
	2012									>10	>10	>10	>10	>10	4	1											1	
	2013									>10	>10		6	1	6		>10											
Idesia polycarpa	2009														1			1									8	
	2010	9	>10	3		1																1			1		1	
	2011			1		2								1		1						1						
	2012		5							3	1						1		1			1		1		3	5	
	2013												1		2		2	1					1			1		

from May to July (82 to 92%), *Morus* spp. in June (67%), *Machilus thunbergii* in July and August (83%), *Aphananthe aspera* from September to December until next January (82 to 100%), and also *Ficus erecta* in September (82%) and *Celtis sinensis* in December (58%) (Fig. 2).

2. Food contents of animals, plants and artificial substances

In the supplemental data among 109 feces collected in 186 weekly surveys after June 2010, animal materials were detected from all feces, as follows: 45 cases of birds (41%), 107 cases of insects (98%), 72 cases of chilopods (67%), 29 cases of gastropods (27%) and 45 cases of other animals (41%). Plant materials were 109 cases of

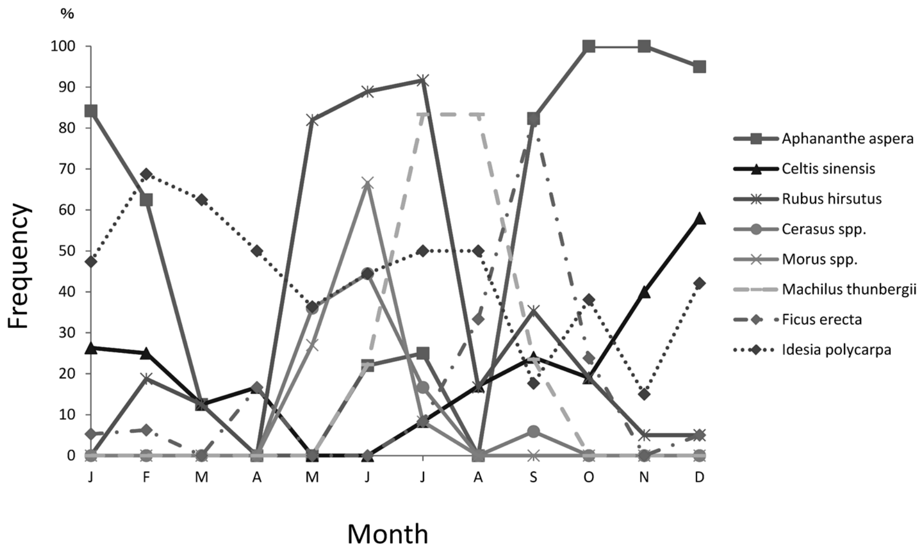

Fig. 2. Monthly successions of seeds appearing in feces.

Table 5. The number (upper row) and percentage (lower row) of each fecal content detected in raccoon dogs from June, 2010 to December, 2013.

Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
Number of surveys	14	12	13	13	13	16	18	17	18	18	16	18	186
Number of feces	11	10	4	2	4	4	10	4	13	17	15	15	109
birds	8	7	4	2	3	3	2	0	3	3	4	6	45
(%)	(73)	(70)	(100)	(100)	(75)	(75)	(20)	(0)	(23)	(18)	(27)	(40)	(41)
insects	11	10	4	2	2	4	10	4	13	17	15	15	107
(%)	(100)	(100)	(100)	(100)	(50)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(98)
chilopods	7	8	4	2	2	4	3	0	11	14	10	7	72
(%)	(64)	(80)	(100)	(100)	(50)	(100)	(30)	(0)	(85)	(82)	(67)	(47)	(66)
gastropods	2	1	0	1	2	2	6	0	3	6	4	2	29
(%)	(18)	(10)	(0)	(50)	(50)	(50)	(60)	(0)	(23)	(35)	(27)	(13)	(27)
other animals	2	0	0	0	2	3	6	0	8	10	8	6	45
(%)	(18)	(0)	(0)	(0)	(50)	(75)	(60)	(0)	(62)	(59)	(53)	(40)	(41)
fruits	11	10	4	2	4	4	10	4	13	17	15	15	109
(%)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)	(100)
leaves etc.	3	0	0	0	0	0	2	1	4	2	1	1	14
(%)	(27)	(0)	(0)	(0)	(0)	(0)	(20)	(25)	(31)	(12)	(7)	(7)	(13)
Artificial substances	3	0	0	0	0	1	0	0	3	2	2	4	15
(%)	(27)	(0)	(0)	(0)	(0)	(25)	(0)	(0)	(23)	(12)	(13)	(27)	(14)

fruits (100%) and 14 other cases of leaves etc. (13%). Artificial substances were also detected in 15 cases (14%), as shown in Table 5.

Among plant materials from 109 feces, some peculiar taxa other than eight taxa already mentioned above were found frequently, i.e. the pericarp of *Ginkgo biloba*, (November to April), the broken seed coats of *Ginkgo biloba*, (January to April), the broken seed coats of family Fagaceae (December to April) and the pericarp of family Ebenaceae (October to January). These taxa covered the blank season of March to April; then the detect ratio for plant food materials in every month was 100% (Table 5). These fruits materials, the leaves or roots were also detected from the feces, but the detect ratio was quite low (0 to 31%) especially from February to June (0%).

Artificial substances were less frequently detected and the ratio was 0% in February to May and in June and August.

Discussion

We showed the rate of collecting feces at a latrine was variable among the seasons and/or years. It has been reported that raccoon dogs possess several latrines within their home range and that an individual changes its preferred latrine and excretion number (Ikeda, 1984). We consider that the variation of sample number partially reflects their latrine preference in any situation and is also related to the rapid decomposition of feces from April to August.

The raccoon dogs in the Imperial Palace use the natural resources, mainly fruits and insects, available in this place throughout the year. In the spring, March to April, when fruiting and dropping decreased, and the detection rates of animal resources including chilopods and birds were greatly increased (Table 5), possibly as supplements; this indicates that fruits are an important factor for the food habits of the raccoon dogs.

We classified the seeds from feces into 95 taxa including 58 taxa identified down to genera/species and these diversified food items are ambiguous in the restricted space of Tokyo Metropolitan. The detection of these items from feces was variable according to the seasons. Previous researches have reported similar results and possible relationships have been discussed (Sasaki and Kawabata, 1994; Hirasawa *et al.*, 2006). Comparison to a report in the Imperial Palace (Sako *et al.*, 2008), the short-term berry type, soft and juicy fruits, e.g. *Rubus hirsutus* and *Machilus thunbergii*, are considered to be a short term main dish intensively supplied in the fruiting period and just succeeded by the dropping period. On the other hand, the long-term berry type, the fruits with relatively hard rinds inside which the ripened flesh is soft, e.g. *Aphananthe aspera* and *Celtis sinensis*, are food resources for several month after the fruiting and dropping periods, and are consided to be long storage food available for the long term. Broken seed coats of *Ginkgo biloba* and family Fagaceae are also found late after their fruiting period for several months, December to April; this indicates that raccoon dogs eat the inner endosperm of these seeds to supplement the insufficient nutrients. This succession of these raccoon dogs' seasonal menu was confirmed during several years in this study, supporting the previous view of Sako *et al.* (2008).

One of the food items, *Idesia polycarpa*, has not been considered well in the previous survey. *Idesia polycarpa* is one of most common trees, with confirmed 150 trunks (2.2% of total trees) in Fukiage Gardens (Biological Laboratory Imperial Household, 1989) and recently has invaded the gaps among the forest made by fallen trees (Kobayashi *et al.*, 2007). The fruits of this plant turn red in autumn and remain on the tree until January. A fruit contains 50 to 70 seeds inside (Sako, unpublished data). The occurrence of this plant species in the feces was less than 10 besides one feces collected July 11, 2010; therefore high occurrence is considered to be an overestimated secondary intake of foraging other food materials.

As a peculiar character in the Imperial Palace, *Aphananthe aspera* was detected in high frequency from September to January, coinciding with the fruiting and dropping period of this plant, and thus it is possibly an important food resource for the raccoon dogs. According to previous researches in the Kanto district, the main plant food items of raccoon dogs were reported to be *Ginkgo biloba*, *Aphananthe aspera* and *Celtis sinensis* in Akasaka Imperial Grounds, Minato-ku, Tokyo (Teduka and Endo, 2005), *Cornus controversa*, *Eurya japonica*, and *Ophiopogon japonicas* or *Familyiriope muscari* in Hinode-machi, west Tokyo (Sakamoto and Takatsuki, 2015), *Castanea crenata*, family Fagaceae and *Viburnum dilatatum* in Ina-machi, Saitama (Kasuya, 2001), *Diospyros kaki* in Kawasaki-shi, Kanagawa (Yamamoto and Kinoshita, 1994). *Aphananthe aspera* is a deciduous broad leaf tree ranging west from the Kanto district west to Honshu, Shikoku and Kyushu, and dominantly grows in the fertile lands near the sea shore. Recently *Aphananthe aspera* is decreasing in its range because of its sensitiveness to air pollution (http://elekitel.jp/elekitel/nature/2009/nt_82_mukunoki.htm), but still good amount of large trees of *Aphananthe aspera* dropping many fruits every autumn season are preserved in the Imperial Palace. The main foods of the raccoon dogs are thought to be the abundant resources which are easily obtained on the ground surface while walking around slowly (Yamamoto and Kinoshita, 1994). Such a situation reflects the differences of potential resource amounts between urban Kanto and the Imperial Palace. Furthermore, *Ginkgo biloba* drop more fruits than *Aphananthe aspera* in this season, indicating that the raccoon dogs in the Imperial Palace prefer to eat *Aphananthe aspera* rather than *Ginkgo biloba*.

Based on the fecal analysis of the Japanese black bear, *Ursus thibetanus*, for seven years, Koike (2010) suggested that the food items were variable among years in relation to the good or poor fruit harvests and that the bears supplement the other food items in the time of poor harvest of their main food. Although we have no data on the harvest amounts per year in the Imperial Palace, and the unstable trend in *Celtis sinensis* is possibly influenced by this factor. However, *Aphananthe aspera* is an absolutely frequent food item from December to March regardless of the years when *Celtis sinensis* is enough available or not. Further in May to July and July and August, *Rubus hirsutus* and *Machilus thunbergii* were detected from the feces frequently in every year. In the Imperial Palace embracing a well-preserved nature environment inhabited by highly diversified fauna and flora (Takeda *et al.*, 2000; Kuramochi *et al.*, 2014), it is considered that the stable food supply maintains the population of the raccoon dog by being available for a long term.

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Appendix. 1. List of seeds detected from feces of the raccoon dog in 2009. Taxa with asterisks indicate seeds which were identified down to species rank.

Year	2009																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.				Feb.				Mar.					Apr.				May					Jun.				Jul.				Aug.					Sep.				Oct.				Nov.					Dec.			
Day	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27
Sampling	○	○	○	○	○	×	○	○	×	×	○	○	×	×	○	○	×	○	○	○	○	○	○	○	○	○	○	×	×	○	○	○	×	×	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ginkgo biloba																																1																				
Houttuynia cordata																																								1												
Houttuynia cf. *cordata**																																																				
Cinnamomum cf. *yabunikkei**																																																				
Lindera umbellata		1																																																		
Machilus thunbergii																									2	>10	>10			8	>10	3																				
Disporum smilacinum																																																				
Disporum cf. *smilacinum**																																																				
Liriope muscari																																																				
Pollia japonica																																																				
Sparganium cf. *erectum**																																																				
Cyperaceae spp.	1																					8	1			2																										2
Poaceae spp.	1							1				1						3	9		3	4	1	1		2					1	1						9		2	1		6						7		1	
Echinochloa spp.																																																	1			1
Eleusine indica																																																				
Oplismenus undulatifolius																																																				
Poa annua																																																				1
Macleaya cordata								1																																												
Akebia quinata																																																				
Delphinium anthriscifolium																						1				1																										
Chrysosplenium cf. *grayanum**																																																				
Parthenocissus cf. *tricuspidata**																																																				
Albizia julibrissin																																																				
Fabaceae spp.																																																				
Indigofera pseudotinctoria																																																				1
Trifolium dubium																																											1									
Cerasus spp.																					>10	3																														
Cerasus cf. *pseudocerasus**																							1																													
Padus cf. *grayana**	1																																																			
Potentilla freyniana																							2			1	1				3																					
Potentilla cf. *freyniana**																										2																										
Potentilla cf. *indica**								1															>10																													
Potentilla spp.																																																				
Rubus hirsutus																		>10	>10	>10	>10	>10		>10	8	3	2																									1
Rubus cf. *hirsutus**																						2																														
Hovenia dulcis																																																				
Aphananthe aspera		4	>10	>10	1						7												1													>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	9	>10	>10
Celtis sinensis																																3									1				1			7	>10	2	4	5
Fatoua villosa																																																				
Ficus erecta																															1					>10	>10	10														
Ficus cf. *erecta**																																																				
Morus spp.																					>10	>10	>10	>10	6																											
Morella rubra																																																				
Carpinus laxiflora																																																				1
Carpinus cf. *tschonoskii**																																																				
Trichosanthes cf. *kirilowii* var. *japonica**																																																				
Oxalis corniculata								1															2																				1									
Acalypha australis																																																				

Appendix. 1. Continued.

Year	2009																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.				Feb.				Mar.					Apr.				May					Jun.				Jul.				Aug.					Sep.				Oct.				Nov.					Dec.			
Day	4	11	18	25	1	8	15	22	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	6	13	20	27
Sampling	○	○	○	○	○	×	○	○	×	×	○	○	×	×	○	○	×	○	○	○	○	○	○	○	○	○	○	×	×	○	○	○	×	×	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Idesia polycarpa								5			1								1			2																		1			1									8
Toxicodendron succedaneum																																																				
Acer palmatum																																																				
Corchoropsis cf. *crenata**																																																				
Brassicaceae spp.																																																				
Orychophragmus violaceus																							2																													
Polygonaceae spp.																																																	1			
Persicaria filiformis																																																				
Polygonum longisetum																																														1						
Polygonum cf. *longisetum**																																																				
Stellaria aquatica																																																				
Stellaria neglecta																		1			2																															
Stellaria spp.																						1				2																										
Achyranthes bidentata var. *japonica*																																																				1
Amaranthaceae spp.																																																				
Amaranthus cf. *hybridus**																																																				
Chenopodium cf. *ambrosioides**																																																				4
Cornus controversa																						3																														
Cornus kousa																																				4																
Cornus cf. *kousa**																																																				
Eurya emarginata																																																				
Eurya japonica																																																				
Eurya cf. *japonica**																																																				
Diospyros lotus																																																				
Diospyros kaki	1	1																																																		
Ebenaceae spp.																																																				
Rubiaceae spp.																										1																										
Galium cf. *spurium* var. *echinospermum**																						1			1		1																									
Ligustrum japonicum																																																				
Ligustrum spp.																																																				
Plantago asiatica																																																				
Plantago lanceolata																						1																														
Veronica persica																																																				
Ajuga decumbens																						1								1																						
Ajuga cf. *decumbens**																																																				
Lamiaceae spp.																																																				
Clinopodium cf. *gracile**																																																				
Lamium amplexicaule																1																																				
Lamium purpureum																																																				
Lamium cf. *purpureum**																																																				
Lamium spp.																																																				
Ilex integra																																																				
Youngia japonica																									1																											
Aralia cf. *cordata**																																														3						
Apiaceae spp.																						>10	5	2	1	7	2																									
Conium cf. *maculatum**																																																				
unidentified	1															1		1	5	1		>10	1	1	1	8	>10				2	2					1	1		3	3		3					6	3		2	>10

Appendix. 2. List of seeds detected from feces of the raccoon dog in 2010. Taxa with asterisks indicate seeds which were identified down to species rank.

Year	2010																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.					Feb.				Mar.				Apr.				May					Jun.				Jul.				Aug.					Sep.				Oct.					Nov.				Dec.			
Day	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26
Sampling	○	○	○	×	○	○	○	×	○	○	○	×	×	○	○	×	×	×	○	×	○	×	○	○	×	×	○	○	○	×	○	○	×	×	×	×	×	○	○	○	○	○	○	×	×	○	○	○	×	○	○	○
Ginkgo biloba							1																					1																								
Houttuynia cordata																																1																				
Houttuynia cf. *cordata**																																																				
Cinnamomum cf. *yabunikkei**															1																																					
Lindera umbellata																																																				
Machilus thunbergii																												>10	>10		>10																					
Disporum smilacinum																							1																													
Disporum cf. *smilacinum**																																																				
Liriope muscari																																																				
Pollia japonica																																																				
Sparganium cf. *erectum**																																																				
Cyperaceae spp.	1						2		3		2			1													4	3	3		1								1								1	2				
Poaceae spp.		1			2		2		>10						1						1		1	1				3																		2	2	4		1		
Echinochloa spp.																																																				
Eleusine indica					1																																															
Oplismenus undulatifolius																																															1	1				
Poa annua																																																				
Macleaya cordata																																																				
Akebia quinata																																																				
Delphinium anthriscifolium																								1					1																							
Chrysosplenium cf. *grayanum**																																														1						
Parthenocissus cf. *tricuspidata**																																																				
Albizia julibrissin																																																				
Fabaceae spp.																													1																							
Indigofera pseudotinctoria																																																				
Trifolium dubium									5																																											
Cerasus spp.																							9	>10			1	9										2														
Cerasus cf. *pseudocerasus**																																																				
Padus cf. *grayana**																																																				
Potentilla freyniana																																																				
Potentilla cf. *freyniana**																																																				
Potentilla cf. *indica**									1																				1																							
Potentilla spp.																			2					1					1																							
Rubus hirsutus							1		1										>10		>10		>10	>10			10	>10	6		4							>10	1													
Rubus cf. *hirsutus**																																																				
Hovenia dulcis																																																				
Aphananthe aspera	>10	>10	>10		>10	>10	8		1																			1											>10	>10	>10	>10	>10			10	>10	>10		>10	>10	6
Celtis sinensis																																							3	1										1		
Fatoua villosa									1																																											
Ficus erecta					7		3							2														2																								
Ficus cf. *erecta**																																																				
Morus spp.																								>10				2																								
Morella rubra																												1																								
Carpinus laxiflora																												1																								
Carpinus cf. *tschonoskii**																																																				
Trichosanthes cf. *kirilowii* var. *japonica**														1																																						
Oxalis corniculata									1															4																							1					
Acalypha australis																												1																								

Appendix. 2. Continued.

Year	2010																									
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Month	Jan.					Feb.				Mar.				Apr.				May					Jun.			
Day	3	10	17	24	31	7	14	21	28	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27
Sampling	○	○	○	×	○	○	○	×	○	○	○	×	×	○	○	×	×	×	○	×	○	×	○	○	×	×
Idesia polycarpa		2			9		3		5	3				8	2				2					2		
Toxicodendron succedaneum																										
Acer palmatum																										
Corchoropsis cf. *crenata**																										
Brassicaceae spp.																										
Orychophragmus violaceus																										
Polygonaceae spp.																			5							
Persicaria filiformis																										
Polygonum longisetum																										
Polygonum cf. *longisetum**																										
Stellaria aquatica																										
Stellaria neglecta																								1		
Stellaria spp.																										
Achyranthes bidentata var. *japonica*																										
Amaranthaceae spp.																										
Amaranthus cf. *hybridus**							1																			
Chenopodium cf. *ambrosioides**																										
Cornus controversa																										
Cornus kousa																										
Cornus cf. *kousa**																										
Eurya emarginata		1																								
Eurya japonica							1																			
Eurya cf. *japonica**																										
Diospyros lotus																										
Diospyros kaki																										
Ebenaceae spp.																										
Rubiaceae spp.																										
Galium cf. *spurium* var. *echinospermum**																										
Ligustrum japonicum																										
Ligustrum spp.																										
Plantago asiatica																										
Plantago lanceolata																										
Veronica persica																										
Ajuga decumbens																										
Ajuga cf. *decumbens**																										
Lamiaceae spp.																										
Clinopodium cf. *gracile**															1											
Lamium amplexicaule																										
Lamium purpureum																										
Lamium cf. *purpureum**																										
Lamium spp.																										
Ilex integra																										
Youngia japonica																										
Aralia cf. *cordata**		1																								
Apiaceae spp.																					5		7	>10		
Conium cf. *maculatum**																										
unidentified		1	>10				2		6		1				2								1	9		

Year																										
Week	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jul.				Aug.					Sep.				Oct.					Nov.				Dec.			
Day	4	11	18	25	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	5	12	19	26
Sampling	○	○	○	×	○	○	×	×	×	×	×	○	○	○	○	○	○	×	×	○	○	○	×	○	○	○
Idesia polycarpa	9	>10	3		1																1			1		1
Toxicodendron succedaneum																										
Acer palmatum																										1
Corchoropsis cf. *crenata**																										
Brassicaceae spp.																										
Orychophragmus violaceus																										
Polygonaceae spp.																										
Persicaria filiformis																										
Polygonum longisetum																						8				
Polygonum cf. *longisetum**																										
Stellaria aquatica																										
Stellaria neglecta		1																								
Stellaria spp.																										
Achyranthes bidentata var. *japonica*																										
Amaranthaceae spp.																					2					
Amaranthus cf. *hybridus**																										
Chenopodium cf. *ambrosioides**																										
Cornus controversa																										
Cornus kousa												1	3													
Cornus cf. *kousa**																										
Eurya emarginata																										
Eurya japonica																										
Eurya cf. *japonica**												3														
Diospyros lotus																	3			1					7	5
Diospyros kaki																										
Ebenaceae spp.																										
Rubiaceae spp.																										
Galium cf. *spurium* var. *echinospermum**		1																								
Ligustrum japonicum												1														
Ligustrum spp.																										
Plantago asiatica		1																								
Plantago lanceolata																										
Veronica persica		1																								
Ajuga decumbens																										
Ajuga cf. *decumbens**																										
Lamiaceae spp.																										
Clinopodium cf. *gracile**																										
Lamium amplexicaule																										
Lamium purpureum																										
Lamium cf. *purpureum**																										
Lamium spp.																										
Ilex integra																										
Youngia japonica																										
Aralia cf. *cordata**																										
Apiaceae spp.	6	8	4		4							1														
Conium cf. *maculatum**																										
unidentified	10	>10	8		2							1	1								2	6				2

Appendix. 3. List of seeds detected from feces of the raccoon dog in 2011. Taxa with asterisks indicate seeds which were identified down to species rank.

Year	2011																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.					Feb.				Mar.				Apr.				May					Jun.				Jul.					Aug.				Sep.				Oct.					Nov.				Dec.			
Day	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25
Sampling	○	×	○	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×	×	○	○	×	×	×	×	×	×	○	○	○	×	×	×	×	×	×	○	○	○	○	○	○	○	○	○	○	○	○	○	×	○
Ginkgo biloba								7																																												
Houttuynia cordata																																																				
Houttuynia cf. *cordata**																																																				
Cinnamomum cf. *yabunikkei**																																																				
Lindera umbellata																																																				
Machilus thunbergii																													>10																							
Disporum smilacinum																															1																					
Disporum cf. *smilacinum**																																																				
Liriope muscari																																																				
Pollia japonica																																																				
Sparganium cf. *erectum**																																															1					
Cyperaceae spp.																													>10	2															1	1	2					
Poaceae spp.	6		1				1															1							1										4	1				1	4	4	3	6				
Echinochloa spp.																																																				
Eleusine indica																																																				
Oplismenus undulatifolius																																														2						
Poa annua																																																				
Macleaya cordata																																																				
Akebia quinata																																												1								
Delphinium anthriscifolium																																																				
Chrysosplenium cf. *grayanum**																																																				
Parthenocissus cf. *tricuspidata**																																																				
Albizia julibrissin																													1		1																					
Fabaceae spp.																																																				
Indigofera pseudotinctoria																																																				
Trifolium dubium																																																				
Cerasus spp.																						>10																														
Cerasus cf. *pseudocerasus**																																																				
Padus cf. *grayana**																																																				
Potentilla freyniana																																																				
Potentilla cf. *freyniana**																																																				
Potentilla cf. *indica**																													1																		1					
Potentilla spp.																																																				
Rubus hirsutus																					>10	>10							>10	5	1							1			2		2									
Rubus cf. *hirsutus**																																																				
Hovenia dulcis																																																				
Aphananthe aspera	1		6				>10																						2									>10	>10	>10	>10	>10	>10	6	>10	>10	>10	>10	>10	6		2
Celtis sinensis																															4								1		9			1	10		4	>10				2
Fatoua villosa																																																				
Ficus erecta																																						>10	2	>10	3											
Ficus cf. *erecta**																													4																							
Morus spp.																						>10																														
Morella rubra																																																				
Carpinus laxiflora																																																				
Carpinus cf. *tschonoskii**																																																				
Trichosanthes cf. *kirilowii* var. *japonica**																																																				
Oxalis corniculata			1																										1																							
Acalypha australis																																																				

Appendix. 3. Continued.

Year	2011																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.					Feb.				Mar.				Apr.				May					Jun.				Jul.					Aug.				Sep.				Oct.					Nov.				Dec.			
Day	2	9	16	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	3	10	17	24	31	7	14	21	28	4	11	18	25	2	9	16	23	30	6	13	20	27	4	11	18	25
Sampling	○	×	○	×	×	×	○	○	×	×	×	×	×	×	×	×	×	×	×	×	○	○	×	×	×	×	×	×	○	○	○	×	×	×	×	×	×	○	○	○	○	○	○	○	○	○	○	○	○	○	×	○
Idesia polycarpa	3		2				2																						1		2								1		1						1					
Toxicodendron succedaneum																																																				
Acer palmatum																																																				
Corchoropsis cf. *crenata**																																																				
Brassicaceae spp.																														1																	1					
Orychophragmus violaceus																																																				
Polygonaceae spp.																																																	1			
Persicaria filiformis																																																				
Polygonum longisetum																																											1	1		3	2	2				
Polygonum cf. *longisetum**																																																				
Stellaria aquatica																																																3				
Stellaria neglecta																																							1													
Stellaria spp.																																																				
Achyranthes bidentata var. *japonica*																																																				
Amaranthaceae spp.																																																				
Amaranthus cf. *hybridus**																																																				
Chenopodium cf. *ambrosioides**																																																				
Cornus controversa																																									1											
Cornus kousa																																																				
Cornus cf. *kousa**																																																				
Eurya emarginata																																																				
Eurya japonica																																																				
Eurya cf. *japonica**																																																				
Diospyros lotus			3																												3																					
Diospyros kaki																																																				
Ebenaceae spp.							1																																													
Rubiaceae spp.																																																				
Galium cf. *spurium* var. *echinospermum**																						2								2																						
Ligustrum japonicum																																													2							
Ligustrum spp.																																																				
Plantago asiatica																																																				
Plantago lanceolata																																																				
Veronica persica																																																				
Ajuga decumbens																																																				
Ajuga cf. *decumbens**																																																				
Lamiaceae spp.																																																				
Clinopodium cf. *gracile**																																																				
Lamium amplexicaule																																																				
Lamium purpureum																																																				
Lamium cf. *purpureum**																																																				
Lamium spp.																																																				
Ilex integra																																																				
Youngia japonica																																																				
Aralia cf. *cordata**																																																				
Apiaceae spp.			1																		1																															
Conium cf. *maculatum**																						1																														
unidentified	1		1																										3										1			1	1	1	1		2	1	2	5		

Appendix. 4. List of seeds detected from feces of the raccoon dog in 2012. Taxa with asterisks indicate seeds which were identified down to species rank.

Year	2012																																																				
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Month	Jan.					Feb.				Mar.				Apr.					May				Jun.				Jul.					Aug.				Sep.					Oct.				Nov.				Dec.				
Day	1	8	15	22	29	5	12	19	26	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30
Sampling	○	○	○	○	○	○	○	○	○	○	○	○	×	○	○	×	×	×	○	○	×	×	○	○	○	×	×	○	○	○	○	×	○	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×
Ginkgo biloba																																																					
Houttuynia cordata																																																					
Houttuynia cf. *cordata**			1																																																		
Cinnamomum cf. *yabunikkei**																																																					
Lindera umbellata																																																					
Machilus thunbergii																												8	>10	>10	>10		>10		2	6	4	2	1														
Disporum smilacinum																																																					
Disporum cf. *smilacinum**																																																					
Liriope muscari											1			3																																							
Pollia japonica																																																					
Sparganium cf. *erectum**																																																					
Cyperaceae spp.					1														1	1			1		>10			3		1														2			1						
Poaceae spp.			3																	3				1																3				4	1	2	2	1	2			1	
Echinochloa spp.																							1																														
Eleusine indica																																																					
Oplismenus undulatifolius																																												1							1		
Poa annua																																																					
Macleaya cordata																																																					
Akebia quinata																																																					
Delphinium anthriscifolium																									5																												
Chrysosplenium cf. *grayanum**																																																					
Parthenocissus cf. *tricuspidata**			1			1	1												2																																		
Albizia julibrissin																																																					
Fabaceae spp.																																																					
Indigofera pseudotinctoria																																																					
Trifolium dubium																																																					
Cerasus spp.																				1					1																												
Cerasus cf. *pseudocerasus**																																																					
Potentilla spp.																			1																																		
Padus cf. *grayana**																																																					
Potentilla freyniana																																																					
Potentilla cf. *freyniana**																																																					
Potentilla cf. *indica**																									4			3																									
Potentilla spp.																			1																																		
Rubus hirsutus								1			1												10	5	>10			5	2	4							2	3				1											
Rubus cf. *hirsutus**																																																					
Hovenia dulcis								1	7																																												
Aphananthe aspera	1	5	3		>10	>10	>10	>10	>10															2														3	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	6	>10		
Celtis sinensis	>10	10	>10	>10	>10	>10	>10	8	>10	2				4																																							
Fatoua villosa																																																					
Ficus erecta																																			>10	>10	>10	>10	>10	4	1											1	
Ficus cf. *erecta**																																							2														
Morus spp.																							3		>10																												
Morella rubra																																																					
Carpinus laxiflora																																																					
Carpinus cf. *tschonoskii**																																																					
Trichosanthes cf. *kirilowii* var. *japonica**																																																					
Oxalis corniculata									1	1	1																																		1								
Acalypha australis																																																					

Appendix. 4. Continued.

Year	2012																																																				
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53
Month	Jan.					Feb.				Mar.				Apr.					May				Jun.				Jul.					Aug.				Sep.					Oct.				Nov.				Dec.				
Day	1	8	15	22	29	5	12	19	26	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	2	9	16	23	30
Sampling	○	○	○	○	○	○	○	○	○	○	○	○	×	○	○	×	×	×	○	○	×	×	○	○	○	×	×	○	○	○	○	×	○	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	×
Idesia polycarpa	1				1	1	4	5	6	1	4	3			3					5			2	1	10			5							3	1						1		1			1		1		3	5	
Toxicodendron succedaneum															1																																						
Acer palmatum																																																					
Corchoropsis cf. *crenata**																							1																														
Brassicaceae spp.																																																					
Orychophragmus violaceus																																																					
Polygonaceae spp.																																																					
Persicaria filiformis																																																			2		
Polygonum longisetum																																																					
Polygonum cf. *longisetum**																																																			1		
Stellaria aquatica														1																																							
Stellaria neglecta																			4																																		
Stellaria spp.																																																					
Achyranthes bidentata var. *aponica*											2	1											2																														
Amaranthaceae spp.																																																					
Amaranthus cf. *hybridus**																																																					
Chenopodium cf. *ambrosioides**																																																					
Cornus controversa																									4																												
Cornus kousa																																																					
Cornus cf. *kousa**																																					1																
Eurya emarginata																																																					
Eurya japonica																																																		3			
Eurya cf. *japonica**																																																					
Diospyros lotus																																																					
Diospyros kaki																																																					
Ebenaceae spp.																																																					
Rubiaceae spp.																																																					
Galium cf. *spurium* var. *echinospermum**											1														1					1										1													
Ligustrum japonicum																																																					
Ligustrum spp.																																																					
Plantago asiatica																																																					
Plantago lanceolata																																																					
Veronica persica																																																					
Ajuga decumbens																			1																																		
Ajuga cf. *decumbens**																																																					
Lamiaceae spp.																									1											1																	
Clinopodium cf. *gracile**																																																					
Lamium amplexicaule																																																					
Lamium purpureum																																																					
Lamium cf. *purpureum**											1																																										
Lamium spp.																																																			1		
Ilex integra																																																					
Youngia japonica																																																					
Aralia cf. *cordata**																																																					
Apiaceae spp.																							1		>10																												
Conium cf. *maculatum**																																																					
unidentified	2									1	4	4			1					3			1		6			3		1					1				3			1		1				1		4	2	2	

Appendix. 5. List of seeds detected from feces of the raccoon dog in 2013. Taxa with asterisks indicate seeds which were identified down to species rank.

Year	2013																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.				Feb.				Mar.					Apr.				May				Jun.					Jul.				Aug.				Sep.					Oct.				Nov.				Dec.				
Day	6	13	20	27	3	10	17	24	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29
Sampling	○	○	○	○	○	○	○	○	○	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	○	○	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ginkgo biloba									1																																							7	1			
Houttuynia cordata																																																				
Houttuynia cf. *cordata**																																																				
Cinnamomum cf. *yabunikkei**																																																				
Lindera umbellata																																																				
Machilus thunbergii																																																				
Disporum smilacinum																																																				
Disporum cf. *smilacinum**																																			1																	
Liriope muscari					3	5	1		1																																											
Pollia japonica						>10																																														
Sparganium cf. *erectum**																																																				
Cyperaceae spp.																																								1			1							1	1	
Poaceae spp.					4																																			3				2	1		4			1		1
Echinochloa spp.																																																				
Eleusine indica																																																				
Oplismenus undulatifolius																																																				
Poa annua																																																				
Macleaya cordata																																																				
Akebia quinata						7																																														
Delphinium anthriscifolium																																																				
Chrysosplenium cf. *grayanum**																																																				
Parthenocissus cf. *tricuspidata**																																																				
Albizia julibrissin																																																				
Fabaceae spp.																																																				
Indigofera pseudotinctoria																																																				
Trifolium dubium																																											1									
Cerasus spp.																																																				
Cerasus cf. *pseudocerasus**																																																				
Padus cf. *grayana**																																																				
Potentilla freyniana																																																				
Potentilla cf. *freyniana**																																																				
Potentilla cf. *indica**																																																				
Potentilla spp.																																																				
Rubus hirsutus																																						1				1		1						1		
Rubus cf. *hirsutus**																																																				
Hovenia dulcis																																																				
Aphananthe aspera		6	2	8		1																													>10	>10		>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10	1	8
Celtis sinensis																																			1	1								2	2	2		>10	>10	>10		>10
Fatoua villosa																																																				
Ficus erecta																																			>10	>10		5	1	6		>10										
Ficus cf. *erecta**																																																				
Morus spp.																																																				
Morella rubra																																																				
Carpinus laxiflora																																																				
Carpinus cf. *tschonoskii**					1																																															
Trichosanthes cf. *kirilowii* var. *japonica**																																																				
Oxalis corniculata																																								1												
Acalypha australis																																																				

Appendix. 5. Continued.

Year	2013																																																			
Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52
Month	Jan.				Feb.				Mar.					Apr.				May				Jun.					Jul.				Aug.				Sep.					Oct.				Nov.				Dec.				
Day	6	13	20	27	3	10	17	24	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25	1	8	15	22	29	6	13	20	27	3	10	17	24	1	8	15	22	29
Sampling	○	○	○	○	○	○	○	○	○	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	○	○	×	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Idesia polycarpa	1	2		2		1	2	1																														1		2		2	1					1			1	
Toxicodendron succedaneum																																																				
Acer palmatum																																																				
Corchoropsis cf. *crenata**																																																				
Brassicaceae spp.																																																				
Orychophragmus violaceus																																																				
Polygonaceae spp.																																																				
Persicaria filiformis																																																				
Polygonum longisetum																																													2		2					
Polygonum cf. *longisetum**																																																				
Stellaria aquatica																																																				
Stellaria neglecta																																																				
Stellaria spp.																																																				
Achyranthes bidentata var. *japonica*																																										1										
Amaranthaceae spp.																																																				
Amaranthus cf. *hybridus**																																																				
Chenopodium cf. *ambrosioides**																																																				
Cornus controversa																																			2					1											1	
Cornus kousa																																																				
Cornus cf. *kousa**																																																				
Eurya emarginata																																																				
Eurya japonica	1				1																																					1								1		
Eurya cf. *japonica**																																																				
Diospyros lotus																																													7			4				
Diospyros kaki	2																																																			
Ebenaceae spp.																																																				
Rubiaceae spp.																																								2												
Galium cf. *spurium* var. *echinospermum**																																																				
Ligustrum japonicum																																																				
Ligustrum spp.									1																																											
Plantago asiatica																																																				
Plantago lanceolata																																																				
Veronica persica																																																				
Ajuga decumbens																																																				
Ajuga cf. *decumbens**																																								1												
Lamiaceae spp.																																																				
Clinopodium cf. *gracile**																																																				
Lamium amplexicaule																																																				
Lamium purpureum																																															1					
Lamium cf. *purpureum**																																																				
Lamium spp.																																																				
Ilex integra																																			1																	
Youngia japonica																																																				
Aralia cf. *cordata**																																																				
Apiaceae spp.																																																				
Conium cf. *maculatum**																																																				
unidentified	2	2	1	1			2																																	3		1	2	1	4	3	2			1	1	