

Tree bark damage caused by Black Bears *Ursus thibetanus* on artificial stands in Chichibu district

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A damaged large tree; DBH=80cm

Chamaecyparis obtusa

Damaged trees

Traces of front teeth



The recent damage; they were damaged from Aug.30 to Sept.3rd, 2006

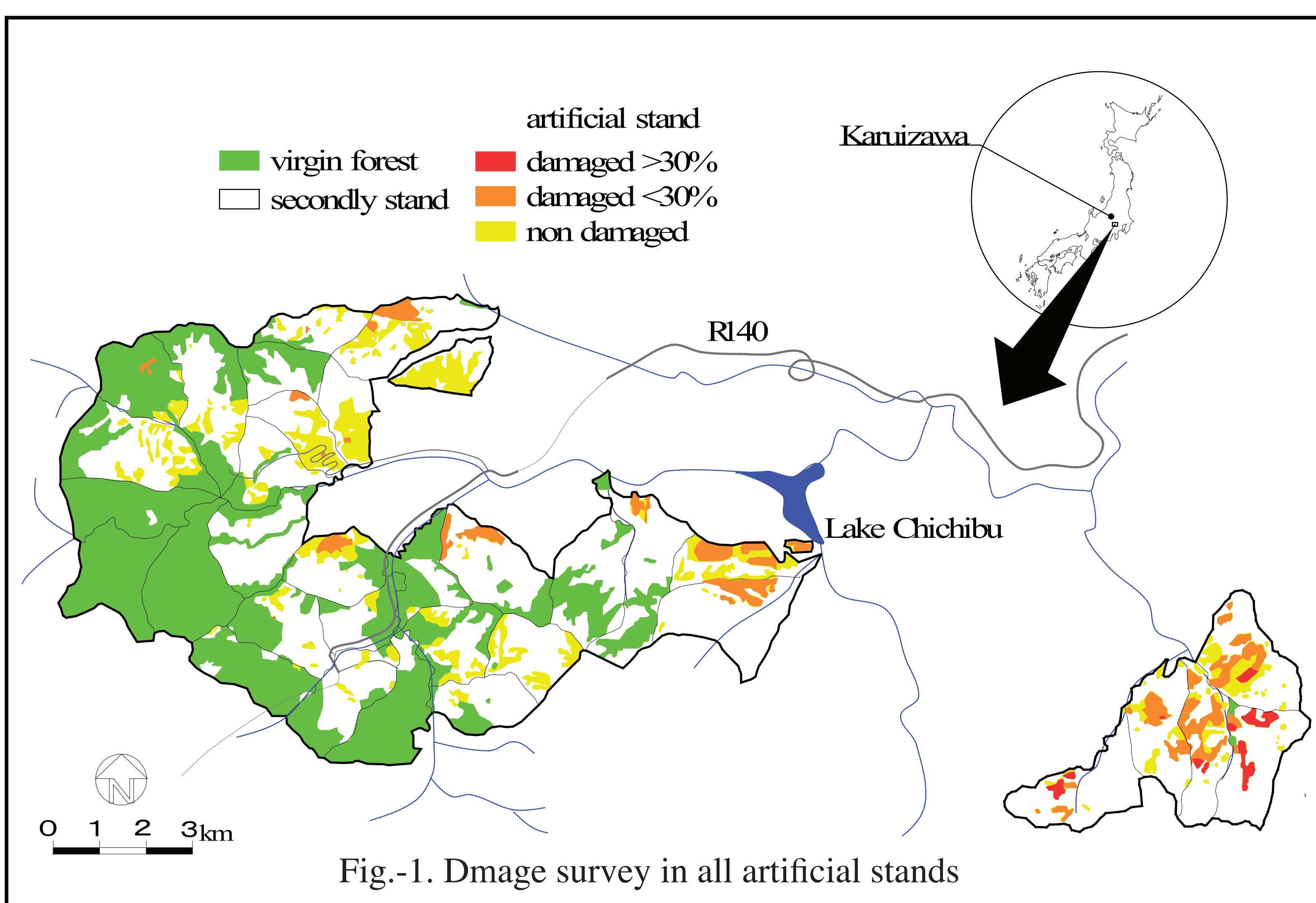


Fig.-1. Dmage survey in all artificial stands

Tab.-1. Quantity of damage according to tree species

species	total number of research			dammaged number and rate						
	stands	area ha	trees volume m3	stands %	trees %	vollume %				
<i>Chamaecyparis obtusa</i>	150	241.93	328,006	47,058	58	38.7	24,777	7.6	3,009	6.4
<i>Cryptomeria japonica</i>	107	148.97	152,551	53,981	26	24.3	2,013	1.3	968	1.8
<i>Larix kaempferi</i>	76	145.46	77,765	20,827	8	10.5	540	0.7	245	1.2
<i>Abies spp.</i>	30	15.61	18,682	2,285	2	6.7	167	0.9	38	1.7
<i>Picea spp.</i>	16	4.02	1,762	840	3	18.8	27	1.5	23	2.7
<i>Pinus spp.</i>	14	7.28	3,276	924	1	7.1	22	0.7	21	2.3
<i>Chamaecyparis pisifera</i>	17	26.8	26,471	10,843	1	5.9	14	0.1	5	0.0
<i>Pinus storob</i>	14	4.35	2,838	1,034	0	0.0	0	0.0	0	0.0
othe softwood spp.	12	1.68	1,310	366	0	0.0	0	0.0	0	0.0
hardwood spp.	22	9.26	3,879	1,164	0	0.0	0	0.0	0	0.0
total	458	605.36	616,540	139,322	99	21.6	27,561	4.5	4,309	3.1

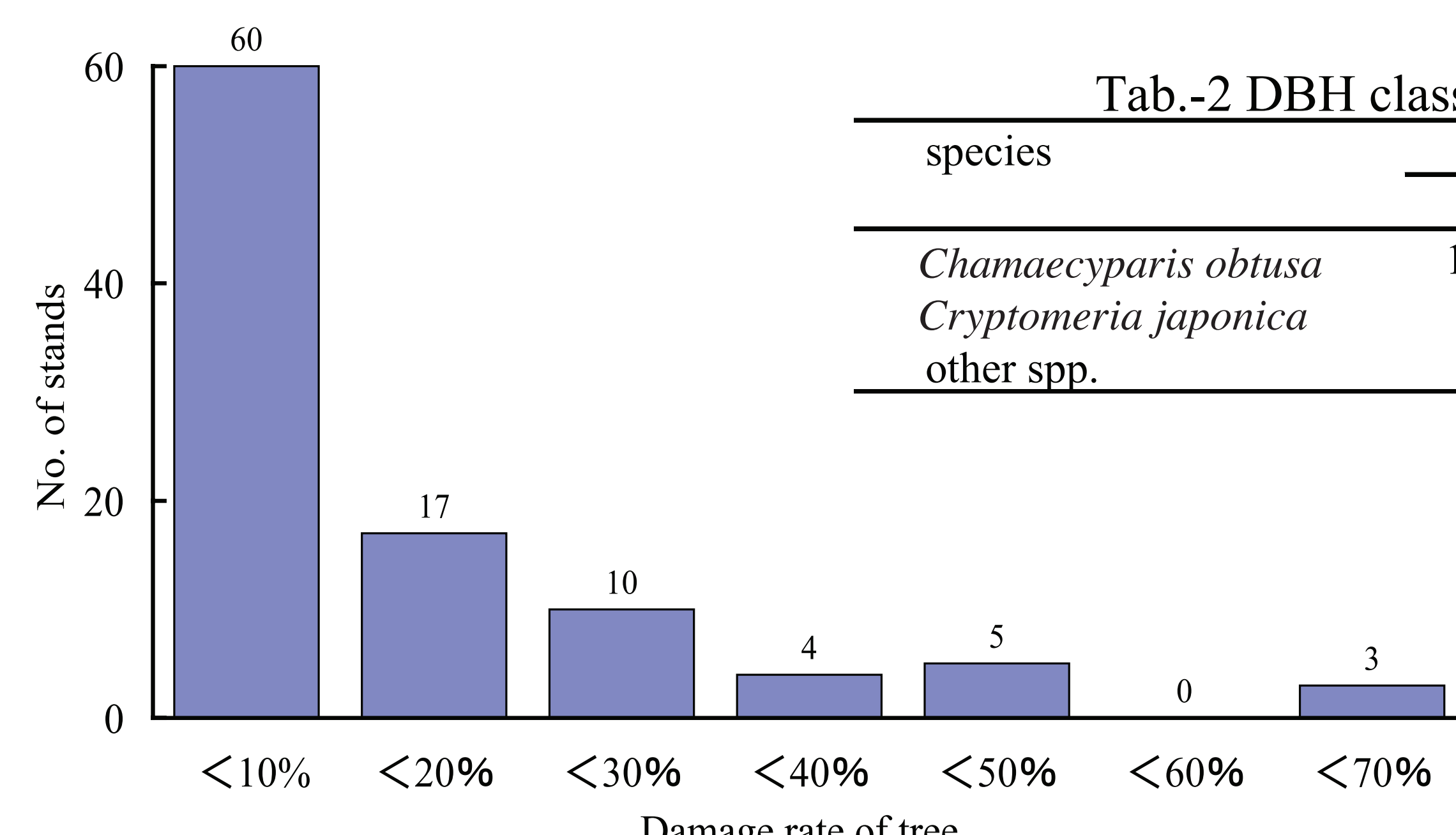


Fig.-2. No. of stands according to damage rate of tree number

Tab.-2 DBH class of damaged trees

species	DBH class				
	5-14	15-24	25-34	35-44	45-54
<i>Chamaecyparis obtusa</i>	10,048	13,465	1,264		
<i>Cryptomeria japonica</i>	136	1,025	700	136	16
other spp.	92	346	281	54	

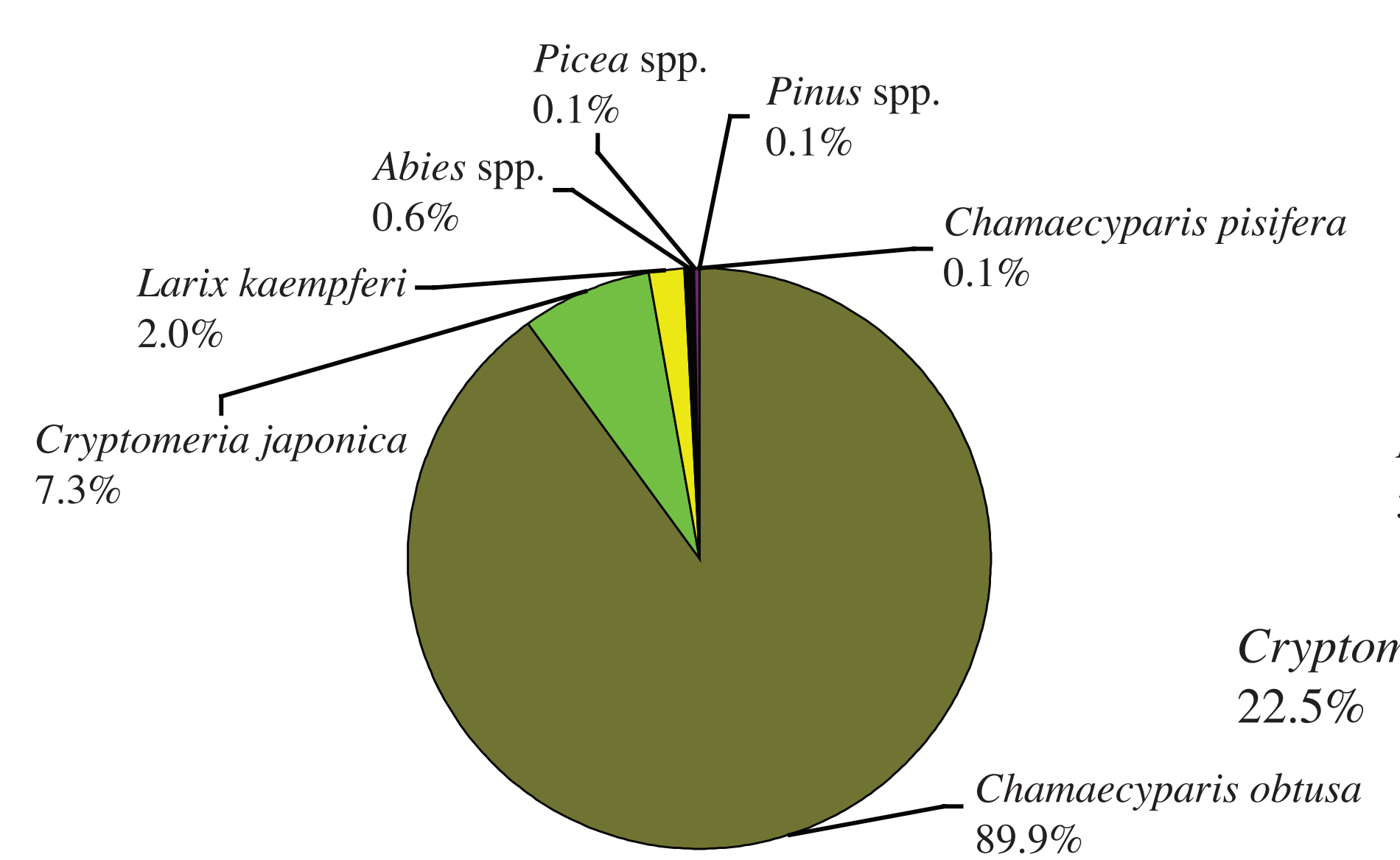


Fig. 3 Number rate of all damaged trees

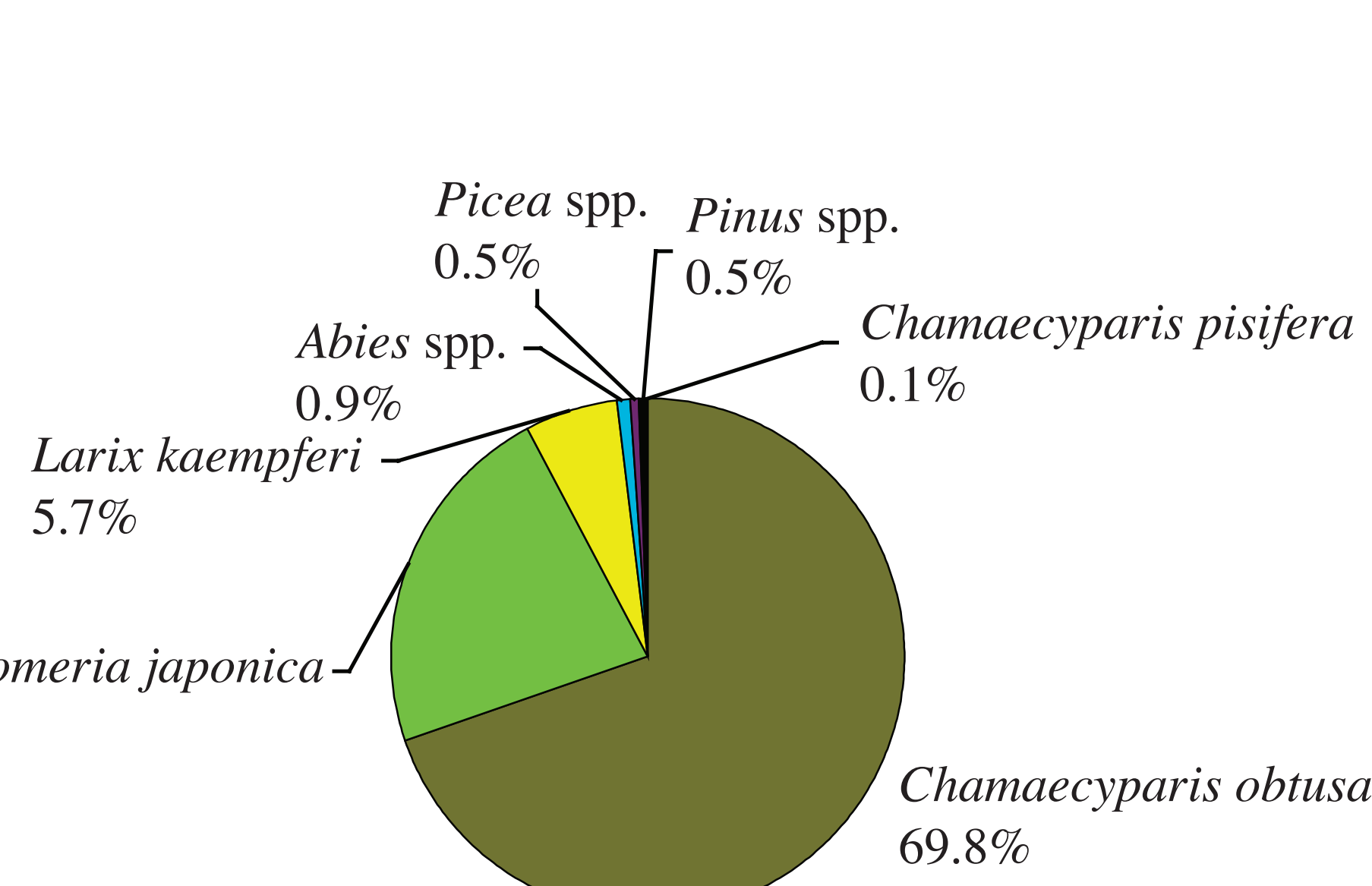


Fig.-4 Volume rate of all damaged trees

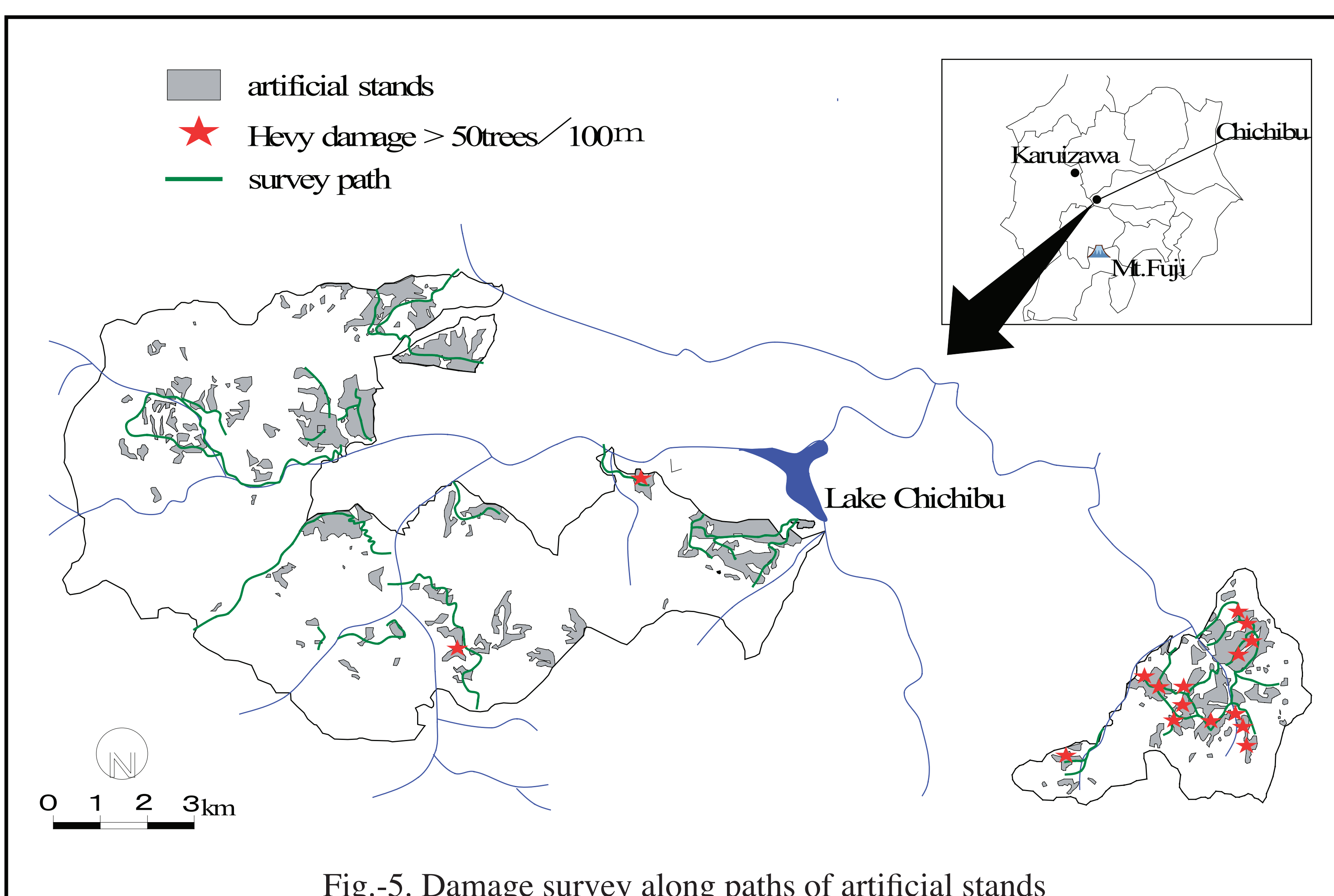


Fig.-5. Damage survey along paths of artificial stands

Artificial plant bark damaged by black bears is common in the Chichibu district. Large trees were also damaged giving motivation for planting deteriorates, before the forests come to ruin. Therefore we examined the present condition of tree bark damage caused by bears.

Bears tear off the bark and scrape cambium cells off with their front teeth and eat it damaging trees. As for the tree it begins to rot and the wood and becomes no longer useful.

Study area

The research was conducted at the University Forest in Chichibu (5,800ha), the University of Tokyo. Artificial stands consist of 767ha; 13% of the total, virgin forests 1,900ha; or 32%, secondly stands 3,100ha; or 54%. The virgin forests consist mainly of *Fagus* stands, *Tsuga* stands and *Fraxinus* stands. The elevation is 530-1980m in altitude.

Methods

- 1) Survey damage accumulated over several years in all artificial stands
We extracted areas more than 0.1ha or 5% and investigated the damage caused in 458 stands of artificial growth older than 20 years old in 1999 and 2000.
- 2) Survey damage along paths near artificial stands, over a one year time period
We surveyed paths, totaling a distance of 50km. We counted the number of damaged trees in a 100m range whenever we came tree upon a damaged tree.

Result

- 1) Damage survey in all artificial stands
We confirmed bark damages on 99 stands; 22% of the 458 artificial stands. The damage ratio was 3.1% in volume and 4.5% in tree number.
- 2) Damage survey along paths of artificial stands
The damage in natural stands was observed among a few tree species, *C. obtusa* and *Pterocarya rhoifolia*. DBH of the damaged trees was 8-60cm. There were 14 locations where we found more than 50 damaged trees in a 100m area. There were some paths where we were unable to discover any damaged trees at all.

