ANNEX C.

DATABASE ON THE EFFECTS OF RADIATION ON TERRESTRIAL PLANTS (RELEVANT TO NORTHERN AREAS), CHRONIC AND ACUTE EXPOSURE. RUSSIAN/FSU DATA.

EFFECTS OF RADIATION ON PLANTS (RELEVANT TO NORTHERN AREAS, RUSSIAN DATA), CHRONIC AND ACUTE EXPOSURE (Effect codes: NE-no effect; CG- cytogenetic effect; REPR-effect on reproduction; MT-effect on mortality; MB-effect on morbidity; ECOL -ecological effect; STIM - stimulation; AD - adaptation)

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P1-1	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of model trees was 15. Age of pine forest was 35 years. 1987-1988.	Chernobyl fallout, also hot particles (Uox)	1,5E+7 Bq/m2 (1986)	(3,6- 4,3)E-3 Gy/day (1988)	15-20 Gy (by May, 1987)	In 1987, on the most damaged plot all pine shoots, generative organs and most part of sleep buds died. Partial necrosis of needles of last years occured.	MT	Abaturov et.al., 1991; Karaban' et.al.,1978; Mishenkov et.al., 1983; Spirin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.
P1-2	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed was 15. Age of pine	Chernobyl fallout, also hot particles (Uox)	1,5E+7 Bq/m2 (1986)	(3,6-4,3)E- 3 Gy/day (1988)	15-20 Gy (by May,1987)	Anatomic and morphological changes in the needle structure were revealed (form of needle section increased, density of resin duct decreased by 40%, number of conductive elements formed by cambium increased). On aixiblates full-grown in 1987,	MB	Abaturov et.al., 1991; Karaban' et.al.,1978; Mishenkov et.al., 1983; Spirin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.

ication NN of recordorganism namenamenameof surface soil contamin ation, B9/m2Gy/dGy/dCodecodeP1-3TreesPinus sylvestris L. Scotch pineforest was 35 years. 1988.forenobyl acident. Formotyl acident. Experimental plot of pine forest in 5-6Chernobyl fallout, also forest was 35 years. 1988.chernobyl a a result of the L. Scotch pineArea contaminated as a result of the code forest in 5-6Chernobyl fallout, also forest was 35 years. 1988.Chernobyl fallout, also fallout, also forest was 35 years. 1987-1988.4.0E+7 fallout, also fallout, also forest was 35 years. 1987-1988.(1.4-1.7)E- fallout, also forest in 5-67-9 Gy (by May,1987)In 1987, oppression of growth of auxiblastes and needles of 1986 were observed.MBAbaturov et.al., 1983; Sprin et.al., 1983; Sprin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.P1-4TreesPinus sylvestris L. Scotch pineArea contaminated fallout, also hot particles (Det of under of trees analyzed was 15. Age of pine forest was 35 years. 1987-1988.4.0E+7 fallout, also hot particles g/day (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattring of needle (flattring of needle (flattring of needle (flattring of needleMBAbaturov et.al., et.al.,1978; Mishenkov et.al., 1991; Karaban' et.al.,1978; (flattring of needle	Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
NN of record rescord surface soil surface soil soil <td>ication</td> <td>organism</td> <td>name</td> <td></td> <td></td> <td>of</td> <td>Gy/d</td> <td></td> <td></td> <td>code</td> <td></td>	ication	organism	name			of	Gy/d			code	
recordsoilsoilsoilsoilanomalous monomial and trinomial brachiblastesP1-3TreesPinus sylvestris as a result of the L. Scotch pineArea contaminated of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed was 15. Age of pine forest was 35 years. extended to the L. ScotchChernobyl fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May,1987)In 1987, oppression of growth of auxiblastes and needles of 1986 were observed.MB MBAbaturov et.al., 1997; Karaban' et.al., 1978; Mishenkov et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.P1-4TreesPinus sylvestris L. Scotch Chernobyl accident. Experimental plot of pine forest was 35 years. 1987-1988.Chernobyl Acte contaminated fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- S, Gy/day (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (1988)MB MBAbaturov et.al., 1991; Karaban' et.al., 1978; May,1987)	NN of					surface					
P1-3 Trees Pinus sylvestris L. Scotch pine Forest was 35 years. Survey of 1987- 1988. Chernobyl fallout, also hot particles (Uox) 4,0E+7 Bq/m2 (1,4-1,7)E- 3 Gy/day (1988) 7-9 Gy (by May,1987) anomalous monomial and trinomial brachiblastes were found. MB Abaturov et.al., 1991; Karaban' et.al.,1978; Karaban', Tikhomirov,1967. P1-4 Trees Pinus sylvestris L. Scotch Area contaminated forest was 35 years. 1987-1988. Chernobyl fallout, also for pine forest was 35 years. 1987-1988. 4,0E+7 Bq/m2 (1,4-1,7)E- 3 Gy/day (1988) 7-9 Gy (by May,1987) In 1987, oppression of growth of auxiblastes and needles of 1986 were observed. MB Abaturov et.al., 1991; Karaban' et.al.,1978; Karaban', Tikhomirov,1967. P1-4 Trees Pinus sylvestris L. Scotch Area contaminated forest was 35 years. 1987-1988. Chernobyl chernobyl actigent. 4,0E+7 fallout, also hot particles (Uox) (1,4-1,7)E- growth of auxiblastes (Uox) 7-9 Gy (by Anatomic and morphological changes in the needle structure (flattomino for actile MB Abaturov et.al., 1991; Karaban' et.al.,1978; Karaban' et.al.,1978;	record					soil					
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P1-3TreesPinus sylvestris L. Scotch pineArea contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed was 15. Age of pine forest was 35 years. 1987-1988.Chernobyl fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May,1987)In 1987, oppression of growth of auxiblastes and needles of 1986 were observed.MBAbaturov et.al., 1991; Karaban' et.al.,1978; Mishenkov et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.P1-4TreesPinus sylvestris L. Scotch L. ScotchArea contaminated the particlesChernobyl fallout, also hot particles4,0E+7 fallout, also hot particles(1,4-1,7)E- May,1987)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (1988)MBAbaturov et.al., et.al., 1979; Karaban', Tikhomirov,1967.				1988.					were found.		
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L. Scotch pineChernobyl accident. Experimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed was 15. Age of pine forest was 35 years. 1987-1988.hot particles (Uox)(1988)needles of 1986 were observed.et.al., 1978; Mishenkov et.al., 1983; Spirin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov, 1967.P1-4TreesPinus sylvestris L. ScotchArea contaminated Chernobyl accident.Chernobyl fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May, 1987)Anatomic and morphological changes in the needle structure (faltering of needleMB et.al., 1978; Mishenkov et.al., 1983; Spirin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov, 1967.			sylvestris	as a result of the	fallout, also	Bq/m2	3 Gy/day	May,1987)	growth of auxiblastes and		1991; Karaban'
pineExperimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed was 15. Age of pine forest was 35 years. 1987-1988.(Uox)(Uox)Mishenkov et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.P1-4TreesPinus sylvestris a sa result of the L. ScotchChernobyl fallout, also hot particles (Uox)4,0E+7 Bq/m2(1,4-1,7)E- (1,4-1,7)E- (1988)7-9 Gy (by morphological changes in the needle structure (fattening of needleMB MBAbaturov et.al., 1991; Kataba' et.al.,1978;			L. Scotch	Chernobyl accident.	hot particles		(1988)		needles of 1986 were		et.al.,1978;
P1-4TreesPinus sylvestris L. ScotchArea contaminated fallout, also bot particlesChernobyl fallout, also fallout, als			pine	Experimental plot	(Uox)				observed.		Mishenkov et.al.,
P1-4TreesPinus sylvestris L. ScotchArea contaminated chernobyl accident.Chernobyl fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMB MBAbaturov et.al., 1991; Karaban' et.al., 1979; Karaban', Tikhomirov,1967.				of pine forest in 5-6							1983; Spirin et.al.,
P1-4TreesPinus sylvestris L. ScotchArea contaminated fallout, also hot particlesChernobyl fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMB Hereit Also Hereit AlsoMB Hereit Also Hereit Also Hereit Also Hereit Also Hereit Also Hereit Also Hereit AlsoMB Hereit Also Hereit Also<				km from ChNPP.							1985; Fedotov
P1-4TreesPinus sylvestris L. ScotchArea contaminated Chernobyl accident.Chernobyl hot particles4,0E+7 lallout, also hot particles(1,4-1,7)E- gylvestris (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMBAbaturov et.al., et.al.,1978;P1-4TreesPinus sylvestris L. ScotchArea contaminated Chernobyl accident.Chernobyl hot particles4,0E+7 (1,4-1,7)E- (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMBAbaturov et.al., et.al.,1978;				West branch of							et.al., 1979;
P1-4TreesPinus sylvestris L. ScotchArea contaminated fallout, also hot particles4,0E+7 fallout, also hot particles(1,4-1,7)E- gylvestris (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMBAbaturov et.al., 1991; Karaban' et.al.,1978;				radioactive trace.							Karaban',
P1-4TreesPinus sylvestris L. ScotchArea contaminated fallout, also hot particles4,0E+7 Bq/m2(1,4-1,7)E- 3 Gy/day (1988)7-9 Gy (by May,1987)Anatomic and morphological changes in the needle structure (flattening of needleMBAbaturov et.al., 1991; Karaban' et.al.,1978;				Total number of							Tikhomirov, 1967.
P1-4 Trees Pinus Area contaminated Chernobyl 4,0E+7 (1,4-1,7)E- 7-9 Gy (by Anatomic and MB Abaturov et.al., P1-4 Trees Pinus Area contaminated Chernobyl 4,0E+7 (1,4-1,7)E- 7-9 Gy (by Matomic and MB Abaturov et.al., P1-4 Trees Pinus Area contaminated Chernobyl 4,0E+7 (1,4-1,7)E- 7-9 Gy (by Matomic and MB Abaturov et.al., L. Scotch Chernobyl accident. hot particles Hot particles (1988) May,1987) morphological changes in the needle structure et.al.,1978; nina Experimental plot (Uox) (Uox) Misherkov et.al. Misherkov et.al.				trees analyzed was							
P1-4TreesPinus sylvestris L. ScotchArea contaminated fallout, also hot particles4,0E+7 fallout, also (1988)(1,4-1,7)E- May,1987)7-9 Gy (by morphological changes in the needle structure (flattening of needleMBAbaturov et.al., 1991; Karaban' et.al.,1978;				15. Age of pine							
P1-4 Trees Pinus Area contaminated Chernobyl 4,0E+7 (1,4-1,7)E- 7-9 Gy (by Anatomic and MB Abaturov et.al., P1-4 Trees Pinus Area contaminated Chernobyl 4,0E+7 (1,4-1,7)E- 7-9 Gy (by Matomic and MB Abaturov et.al., L. Scotch Chernobyl accident. hot particles M(1988) May,1987) morphological changes in 1991; Karaban' nina Experimental plot (IJox) (IJox) Misparboy et al Misparboy et al				forest was 35 years.							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	D1 4	Tassa	Dimo	1987-1988.	Charmahad	4.000 + 7	(1 4 1 7)E	7.0.0	Anotomic and	MD	All advances at all
<i>Sylvestris</i> as a result of the failout, also Bq/III2 (1988) May,1987) morphological changes in the needle structure et.al.,1978; <i>nine</i> Experimental plot (Lox) Mishenkov et al	P1-4	Trees	Pinus	Area contaminated	fallout also	4,0E+7	(1,4-1,7)E-	7-9 Gy (by May 1097)	Anatomic and	MD	Abaturov et.al.,
<i>L. Scolch</i> Chemodyl accident. not particles (1988) the needle structure et.al., 1978,			sylvesiris	as a result of the	hot montiales	Бq/III2	5 Gy/day	May,1987)	the needle structure		1991; Karaban
			L. Scolch	Europimontal plat	(Uov)		(1988)		(flattening of peodle		et.al.,1978; Mishanlayy et al
price Experimental port (COX) (Indefinition of the construction of			pine	Experimental plot	(Uox)				(flattening of needle,		Misnenkov et.al.,
line from ChNDD				or price forest in 5-0					increased on 60%) were		1985; Spirin et.al.,
West bronch of a stal 1070;				Wast branch of					abserved		1985; Fedolov
vieto trancia di anchi di				radioactive trace					observed.		Cl.al., 1979, Karaban'
Tilhomirov 1067				Ago of pipe forest							Tikhomirov 1067
				Age of pile lotest							1 IKHUIIIIIUV,1907.
number of trees				number of trees							
analyzed -15				analyzed _15							

Identif ication NN of record	Type of organism	Latin name	Impact Studies of 1987-	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P1-5	Trees	Pinus sylvestris L. Scotch pine	1988. Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5-6 km from ChNPP. West branch of radioactive trace. Total number of trees analyzed - 15.	Chernobyl fallout, also hot particles (Uox)	1,5E+6 Bq/m2	(2,4- 4,8)E-4 Gy/day (1988)	2-3 Gy (by May,1987)	In the plot with the lowerst density contamination visible signs of radiation damage were not revealed.	NE	Abaturov et.al., 1991; Karaban' et.al.,1978; Mishenkov et.al., 1983; Spirin et.al., 1985; Fedotov et.al., 1979; Karaban', Tikhomirov,1967.
P2-1	Trees	Pinus sylvestris L. Scotch pine Pollen	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest near v.Chistogalovka. Total number of trees analyzed - 25.	Cs-137, Sr- 90, hot particles		(1,4- 2,6)E-3 Gy/day (1990); (9,6- 19,2)E-4 Gy/day (1991)	6-8 Gy (by 01.05.90)	Strong correlation between the pollen viability and level of radioactive contamination was revealed from comparison of results obtained on the plots under study. In 1990 and 1991, pollen viabilities were $(75,7\pm2,3)\%$ and $(74,7\pm3,5)\%$, respectively. In 1990, percentages of branching and multi- branching pollen tubes having 4 and more shoots amounted to 38,8% and	MB	Surso, 1993.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
								1,6% respectively (in the		
								control 28,8% and 0,1%).		
P2-2	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,4 -	1,0-1,2 Gy	Strong correlation	MB	Surso, 1993.
		sylvestris	as a result of the	90, hot		2,6)E-4	(by	between the pollen		
		<i>L</i> .	Chernobyl accident.	particles		Gy/day	01.05.90)	viability and level of		
		Scotch	Experimental plot			(1990);(4,8		radioactive contamination		
		pine	of pine forest			- 19,2)E-5		was revealed from		
		Pollen	(Izumrudnoye).			Gy/day		comparison of results		
			Total number of			(1991)		obtained on the plots under		
			trees analyzed - 20.					study. In 1990 and 1991,		
								pollen viability were		
								(83,1±3,2)% and		
								(85,0±1,8)%, respectively.		
								In 1990, percentages of		
								branching and multi-		
								branching pollen tubes		
								having 4 and more shoots		
								amounted to 55,5% and		
								2,0%, respectively (in the		
								control - 28,8 and 0,1%).		
P2-3	Trees	Pinus	Area contaminated	Cs-137, Sr-		(3,6-8,4)E-	2,5-3,5 Gy	Strong correlation	MB	Surso, 1993.
		sylvestris	as a result of the	90, hot		4 Gy/day	(by	between the pollen		
		<i>L</i> .	Chernobyl accident.	particles		(1990);	01.05.90)	viability and level of		
		Scotch	Experimental plot			(1,2-6,0)E-		radioactive contamination		
		pine	of pine forest (near			4 Gy/day		was revealed from		
		Pollen	the farm of Novo-			(1991)		comparison of results		
			Shepelichi					obtained on the plots under		
			forestry). Total					study. In 1990 and 1991,		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d	-		code	
NN of	_				surface	-				
record					soil					
					contamin					
					ation,					
					Bq/m2					
			number of trees					pollen viabilities were		
			analyzed - 20.					$(84,2\pm2,5)\%$ and		
								$(83,6\pm3,1)\%$, respectively.		
								In 1990, percentages of		
								branching and multi-		
								branching pollen tubes		
								having 4 and more shoots		
								amounted to 52,9% and		
								2,1% (in the control 28,8		
								and 0,1%).		
P2-4	Trees	Pinus	Area contaminated	Cs-137, Sr-		(6,0-24)E-	20-25 Gy	In 1990 and 1991(near the	MB	Surso, 1993.
		sylvestris	as a result of the	90, hot		4 Gy/day	(by	railway crossing and		
		Ĺ.	Chernobyl accident.	particles		(1990);(4,8	01.05.90)	abandoned concrete		
		Scotch	Experimental plot	1		-20,4)E-4	,	mixing plant and		
		pine	of pine forest (near			Gy/day		v.Yanov), pollen		
		Pollen	the railway crossing			5 5		viabilities were		
			between the					$(72,9\pm4,8)\%$ and		
			abandoned concrete					$(77,4\pm3,9)\%$, respectively.		
			mixing plant and					In 1990, percentages of		
			v.Yanov). Total					branching and multi-		
			number of trees					branching pollen tubes		
			analyzed - 25.					having 4 and more shoots		
			, i i i i i i i i i i i i i i i i i i i					amounted to 41,5% and		
								8,0% respectively (in the		
								control 28,8% and 0,1%).		
P3-1	Trees	Pinus	Field experiment	Acute			50 Gy	Trees of 1-2nd classes. By	MB	Spirin et.al., 1983;
		sylvestris	(5-13 May,1977):	external				the end of the 1st year after		Karaban' et.al,
		L.	Acute exposure of	gamma				exposure, in isodose area		1980; Spirin,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Scotch	an experimental	exposure				of 50 Gy numbers of living		1981.
		pine	plot of pine-birch					were 80%. In 2 years after		
			forest (trees of 30-					exposure, in isodose areas		
			year old). The					of 25 and 50 Gy numbers		
			source of exposure					of living trees were 80 and		
			was a mobile					50%, respectively. In 3		
			gamma-facility					years after exposure, in		
			with Cs-13/ (total					isodose areas of 15, 25 and		
			activity about					50 Gy numbers of living		
			1,18E+15 Bq).					trees were 90,70 and 30%,		
			Effects on trees of					respectively.		
			1st-2nd classes							
			(Kralt							
			r_{220}							
D3 2	Troos	Dimus	II-550. Field experiment				1.50 Gy	Trace of 3th class. In 1	MB	Spirin at al. 1083:
1 5-2	TICCS	sylvestris	$(5_13 \text{ May } 1977)$				1-50 Gy	vear after exposure in	WID	Karaban' et al
		J	$(5^{-15} \text{ widy}, 1777)$.					isodose areas of 1-2.5:5-		1980: Spirin
		L. Scotch	an experimental					10: 15: 25 and 50 Gy		1980, Spirin, 1981
		nine	nlot of pine-birch					numbers of living trees		1901.
		pine	forest (trees of 30-					were 80: 90: 80: 65 and		
			vear old) The					70% respectively In 2		
			source of exposure					vears after exposure in		
			was a mobile					isodose areas of 1-2.5: 5-		
			gamma-facility					10: 15: 25 and 50 Gv		
			with Cs-137 (total					numbers of living trees		
			activity about					were 65;90; 80; 65 and		
			1,18E+15 Bq).					50%, respectively. In 3		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			Effects on trees of					years after exposure, in		
			3rd class (Kraft					the isodose areas of 1-2,5;		
			classification),					5-10; 15; 25 and 50 Gy		
			n=164.					numbers of living trees		
								were 65;90; 60; 25, and		
								25%, respectively.		
P4-1	Trees	Pinus	Area contaminated	Cs-137, Sr-		1,5E-3		24,3% pines died; 11,9%	MB	Pautov,
		sylvestris	as a result of the	90, hot		Gy/day		pines dried up; 30,8%		Il'chukov,1993.
		L.	Chernobyl accident.	particles		(1990)		pines were weakened; 30%		
		Scotch	Damaged pine					pines were healthy.		
		pine	stand in the area of					Natural renewal of birch,		
			v.Chistogalovka-					field-ash (Sorbus		
			station Yanov (west					aucuparia), buckthorn and		
			trace of radioactive					willow was observed.		
			fallout). 1990.					Degree of fruiting		
				~				decreased.		
P4-2	Trees	Pinus	Area contaminated	Cs-137, Sr-		3,4E-3		78% pines died; 2,9%	MT	Pautov,
		sylvestris	as a result of the	90, hot		Gy/day		pines were healthy.		Il'chukov,1993.
		L.	Chernobyl accident.	particles		(1990)		Natural renewal of birch,		
		Scotch	Damaged pine					field-ash (Sorbus		
		pine	stand in the area of					aucuparia), buckthorn and		
			v.Chistogalovka-					willow have been marked.		
			station Yanov (west					Degree of fruiting		
			trace of radioactive					decreased.		
			fallout). 1990.							
P4-3	Trees	Pinus	Area contaminated	Cs-137, Sr-		4,6E-3		87,4% pines died; 0,9%	MT	Pautov,
		sylvestris	as a result of the	90, hot		Gy/day		pines were healthy.		Il'chukov,1993.
1		<i>L</i> .	Chernobyl accident.	particles		(1990)		Natural renewal of birch,		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Scotch	Damaged pine					field-ash (Sorbus		
		pine	stand in the area of					aucuparia), buckthorn and		
			v.Chistogalovka-					willow were found. Degree		
			station Yanov (west					of fruiting decreased.		
			trace of radioactive							
D5 1	Turn	D:	fallout). 1990.	G. 127 S.	(1.951).5		05100		CTIM	IZ - 1 - 1 1
P3-1	Trees	Pinus	Area contaminated	CS-157, ST-	(1,85E+5)		0,5-1,0 Gy	In vegetation season of	511M	Kalchenko, Endatau 2001.
		sylvesiris	as a result of the	90, Ilot	-3, /E+3)			(additionally growth of		Fedolov, 2001;
		L. Saatah	(v Ditvotki)	particles	Бq/III2 (1086)			(additionally growth of		Alcheliko
		nina	(V.Dityatki).		(1980)			allitual shoots) was		et.al.,2000.
		pine						visible radiation effects		
								were not observed		
P5-2	Trees	Pinus	Area contaminated	Cs-137 Sr-	(1.48E+6)		1.0-5.0 Gv	In the first two years after	MB	Kalchenko
152	11005	svlvestris	as a result of the	90. hot	-		1,0 5,0 69	the accident decrease of	111D	Fedotov, 2001:
		L.	Chernobyl accident	particles	1.85E+6)			annual growth.		Kalchenko
		Scotch	(v.Zapol've).	F	Ba/m2			morphological changes of		et.al2000.
		pine			1			vegetative organs (second		
		1						growth, variation of needle		
								length, gemmation on the		
								apex of annual shoots)		
								were observed.		
P5-3	Trees	Pinus	Area contaminated	Cs-137, Sr-	(3,33E+6		5,0-10 Gy	Oppression of growth of	MB	Kalchenko,
		sylvestris	as a result of the	90, hot	- 3,7E+6)			shoots, needles, growth of		Fedotov, 2001;
		<i>L</i> .	Chernobyl accident	particles	Bq/m2			wood, damage of part of		Kalchenko
		Scotch	(v.Lelev).					crowns and died of the		et.al.,2000.
		pine						lower class of trees were		
								observed.		

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Ba/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P5-4	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident (v.Lelev).	Cs-137, Sr- 90, hot particles	(3,33E+6) - 3,7E+6) Bq/m2		5,0-10 Gy	Changes of morphogenesis of vegetative organs, changes in needle ultrastructure, depression of growth of meristematic tissues and short-cut shoots were observed.	MB	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-5	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident (v.Chistogalovka).	Cs-137, Sr- 90, hot particles	(1,48E+7 - 1,85E+7) Bq/m2		5,0-15 Gy	Change of generative organs manifested themselves in form of decrease of male flowers, decrease in the numbers of seeds in cones, decrease of seed germination.	MB	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-6	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident (v.Chistogalovka).	Cs-137, Sr- 90, hot particles	(1,48E+7 - 1,85E+7) Bq/m2		5,0-15 Gy	During the next three years in the area of moderate damage, recovery of trees have been occured .	REP R	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-7	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Sublethal area of radioactive damages of trees	Cs-137, Sr- 90, hot particles	(1,48E+7 - 2,04E+7) Bq/m2		10-20 Gy	Part of trees died. By 1997, about 90% of pines died, and 10% of pines restored.	MT	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-8	Trees	Pinus sylvestris L.	Area contaminated as a result of the Chernobyl accident.	Cs-137, Sr- 90, hot particles	(2,96E+7 - 5,0E+7) Bq/m2		80-100 Gy	By May of 1986, all pine forest died.	MT	Kalchenko, Fedotov, 2001; Kalchenko

Identif ication NN of record	Type of organism	Latin name Scotch pine	Impact Lethal area of radioactive damages of trees ("red forest").	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference et.al.,2000.
P5-9	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident (v.Chistogalovka).	Cs-137, Sr- 90, hot particles	(1,48E+7 - 1,85E+7) Bq/m2		5,0-15 Gy	<i>Cytogenetic effects.</i> In 1986-1987, in germs of seeds numbers of cells with chromosomal aberrations were 7 times higher then those in the control. In 1993, cytogenetic effects remained at the level of first two years after the accident, being about 8 times higher than the control values. In 1997- 1998, levels of cytogenetic effects were still 2-3 times higher than the control.	CG	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-10	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident (v.Dityatki and Zapol'ye).	Cs-137, Sr- 90, hot particles	(1,85E+5 - 1,85E+6) Bq/m2		0,5-5,0 Gy	<i>Cytogenetic effects.</i> In 1986-1987, numbers of cytogenetic damages did not differ from the control.	CG	Kalchenko, Fedotov, 2001; Kalchenko et.al.,2000.
P5-11	Trees	Pinus sylvestris L.	Area contaminated as a result of the Chernobyl accident	Cs-137, Sr- 90, hot particles	(1,85E+5 - 1,85E+6)		0,5-5,0 Gy	In 1997-1998, numbers of cytogenetic damages did not differ from the control.	CG	Kalchenko, Fedotov, 2001; Kalchenko

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Scotch	(v.Dityatki and		Bq/m2					et.al.,2000.
		pine	Zapol'ye).		-					
P5-12	Trees	Pinus	Area contaminated	Cs-137, Sr-	(1,48E+7		10-20 Gy	Cytogenetic effects. In	CG	Kalchenko,
		sylvestris	as a result of the	90, hot	-			1993, the levels of		Fedotov, 2001;
		Ĺ.	Chernobyl accident.	particles	2,04E+7)			cytogenetic effects		Kalchenko
		Scotch	Sublethal area of	•	Bq/m2			exceeded the control by 3		et.al.,2000.
		pine	radioactive					times.		
		Î	damages of trees							
P5-13	Trees	Pinus	Area contaminated	Cs-137, Sr-	(1,85E+5		0,5-20 Gy	Genetic effects. Mutation	CG	Kalchenko,
		sylvestris	as a result of the	90, hot	-			frequency in fermental		Fedotov, 2001;
		L.	Chernobyl accident.	particles	2,04E+7)			locuses were 4 -17 times		Kalchenko
		Scotch	Pine forest on	-	Bq/m2			higher, and levels of cells		et.al.,2000.
		pine	transect from the		-			with chromosomal		
		Î	Chernobyl NPP to					aberrations in seed germs		
			boundary of the 30-					were 1,5 - 7 times higher		
			km zone was					then those in the control.		
			studied. Genetic							
			effects in pine seeds							
			of first two							
			reproductions were							
			analyzed.							
P6-1	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,2-		Morphological changes.	ECO	Sidorov, 1994;
		sylvestris	as a result of the	90, hot		9,5)E-3		Growth of shoots was not	L	Sidorov, 1996.
		<i>L</i> .	Chernobyl accident.	particles		Gy/day		observed. Some trees had		
		Scotch	Pines in the 30-km					short cactus-shaped and		
		pine	area of the					pineapple-shaped shoots of		
		_	Chernobyl					1986. Needle were curved,		
			NPP.Trees were 10-					fleshy, dark and hard.		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			12 years old. 1987.					Sizes of buds were higher		
								then those in the control.		
								New shoots were formed		
								from sleep buds directly on		
								the stems. At 0,04-0,43 Gy		
								awakening of sleep buds		
								was marked. Some pines		
								had formations resembling		
								the "witches brooms".		
P6-2	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,2-		Chromosomal aberrations.	CG	Sidorov, 1994;
		sylvestris	as a result of the	90, hot		9,5)E-3		In 1987, levels of		Sidorov, 1996.
		<i>L</i> .	Chernobyl accident.	particles		Gy/day		chromosomal aberrations		
		Scotch	Cultures of pines in					and other damages were		
		pine	the 30-km area of					practically the same at		
			the Chernobyl NPP.					different exposure levels;		
			Trees were 10-12					yield of chromosomal		
			years old. 1987.					aberrations did not		
								changed up to 1990.		
P7-1	Trees	Pinus	Area contaminated	Ce-144;Ru-			5-6 Gy and	Multybuds. On the shoots	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			higher (by	of first degree about 15-20,		Taskaev, 1994;
		<i>L</i> .	Chernobyl accident;	95;Nb-			01.05.87)	sometimes up to 30 buds		Kozubov,
		Scotch	4 km to the west;	95;Cs-				were formed per one		Taskaev, 1990;
		pine	pine forest (trees	134;Cs-				shoot. As a rule, these		Kozubov et.al.,
			25-35-years old).	137;Sr-90;				buds had big size,		1993.
				hot particles				congested and disordered		
								allocation.		
P7-2	Trees	Pinus	Area contaminated	Ce-144;Ru-			0,3-0,4 Gy	Transformation of bud	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			(by	scales. In fall of 1986, in		Taskaev, 1994;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		L.	Chernobyl accident;	95;Nb-			01.05.87)	10-15% of investigated		Kozubov,
		Scotch	4 km to the west;	95;Cs-				pines the transformations		Taskaev, 1990;
		pine	pine forest (trees	134;Cs-				of bud peels into leaf-like		Kozubov et.al.,
			25-35-years old).	137;Sr-90;				formations have been		1993.
				hot particles				revealed.		
P7-3	Trees	Pinus	Area contaminated	Ce-144;Ru-			0,3-0,4 Gy	Second growths. In fall of	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			(by	1986, short and thick		Taskaev, 1994;
		<i>L</i> .	Chernobyl accident;	95;Nb-			01.05.87)	second growths have been		Kozubov,
		Scotch	4 km to the west;	95;Cs-				grown on some pine trees.		Taskaev, 1990;
		pine	pine forest, trees	134;Cs-				In some cases, on these		Kozubov et.al.,
			25-35-years old	137;Sr-90;				shoots the vegetative buds		1993.
				hot particles				were formed on the place		
								of brachyblasts.		
P7-4	Trees	Pinus	Area contaminated	Ce-144;Ru-			4-5 Gy and	Buds with necrotic apex.	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			higher	In 1986, all young shoots		Taskaev, 1994;
		<i>L</i> .	Chernobyl accident;	95;Nb-				on pine trees died on the		Kozubov,
		Scotch	4 km to the west;	95;Cs-				upper and lower crown		Taskaev, 1990;
		pine	trees 25-35-years	134;Cs-				parts.		Kozubov et.al.,
			old	137;Sr-90;						1993.
				hot particles						
P7-5	Trees	Pinus	Area contaminated	Ce-144;Ru-			4-5 Gy and	At the bottom of shoots	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			higher	two buds were formed in		Taskaev, 1994;
		<i>L</i> .	Chernobyl accident;	95;Nb-				the fall of 1986. One of		Kozubov,
		Scotch	4 km to the west;	95;Cs-				the buds was normal, and		Taskaev, 1990;
		pine	trees 25-35-years	134;Cs-				the second bud had a long		Kozubov et.al.,
			old	137;Sr-90;				subulate form. Such long		1993.
				hot particles				buds consisted of covering		
								peels, and their apex was		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
D7 (Ŧ	D:	A	C 144 D			(2.4) (10	fully necrotic.		¥7 1
P/-6	Trees	Pinus	Area contaminated	Ce-144;Ru-			(3-4) - (10-	Shoots with short growth.	MB	Kozubov,
		sylvestris	as a result of the	106;Zr-			20) Gy	In 1986, heavy reduction		Taskaev, 1994;
		L.	Chernobyl accident;	95;Nb-				of growths of leading		Kozubov,
		Scotch	4 km to the west;	95;Cs-				shoots occured.		Taskaev, 1990;
		pine	trees 25-35-years	134;Cs-						Kozubov et.al.,
			old	13/;SI-90;						1993.
D7 7	Traca	Dimus	Area contaminated	Co 144.Du			(2.2) (6	Cigantian of logf	MD	Voruhov
r/-/	Tiees	r inus	Area contaminateu	106.7r			(2-3) - (0-8) G V	apparatus Incrosso of	MD	Kozubov, Taskaov 1004:
		I Scotch	Chernobyl accident:	100,21- 95·Nh			8) Gy	needles in the anical part		Kozuboy
		L. Scolen	A km to the west:	95.Co				of spruce shoots and in the		Taskaay 1000.
		Picea	trees 25-35-years	134·Cs-				basis of pine shoots was		Kozubov et al
		I ink	old	137.Sr-90.				found Increase of leafs		1993
		Spruce.	olu	hot particles				accompained by changes		1775.
		Ouercus		not purticies				in their form was revealed		
		L:						in oak trees, field-ash.		
		Sorbus						linden, and locust. In 1988.		
		aucupari						marked tendency to		
		a Field-						needle gianticm was		
		ash: Tilia						preserved.		
		L.						1 ×		
		Linden;								
		Acacia								
		Willd.								
		Acacia								
P7-8	Trees	Picea	Area contaminated	Ce-144;Ru-			3-10 Gy	Deviation in histogenesis.	CG	Kozubov,
		abies	as a result of the	106;Zr-				In exposured plants the		Taskaev, 1994;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Common	Chernobyl accident;	95;Nb-				relative volumes of		Kozubov,
		spruce	4 km to the west; 7-	95;Cs-				epidermis, hypodermis,		Taskaev, 1990;
			25-years old	134;Cs-				aeriferous and crusted		Kozubov et.al.,
			spruces	137;Sr-90;				parenchyma increased; in		1993.
				hot particles				the same time volume of		
								phloem and xylem		
								decreased. Increase in		
								diameters of hypodermis		
								cells was observed, also		
								decrease in diameters of		
								xylem, aeriferous and		
								crusted parenchyma cells.		
								In most cases, the radiation		
								exposure resulted in		
								accretion of mechanical		
								tissues.		
P7-9	Trees	Picea	Area contaminated	Ce-144;Ru-			3,5-4 Gy	Doses to spruce tress of	MT	Kozubov,
		abies	as a result of the	106;Zr-				3,5-4 Gy and higher		Taskaev, 1994;
		Common	Chernobyl accident;	95;Nb-				resulted in damage of		Kozubov,
		spruce	4 km to the west;	95;Cs-				stems formed in 1985. In		Taskaev, 1990;
			spruce trees 7-25-	134;Cs-				1986, most part of cells in		Kozubov et.al.,
			years old.	137;Sr-90;				cambium ring of such		1993.
				hot particles				shoots died.		
P7-10	Trees	Picea	Area contaminated	Ce-144;Ru-			4-5 Gy	Doses to spruce trees of 4-	NE	Kozubov,
		abies	as a result of the	106;Zr-				5 Gy did not cause any		Taskaev, 1994;
		Common	Chernobyl accident;	95;Nb-				substantial damage of		Kozubov,
		spruce	4 km to the west;	95;Cs-				cambium initialis; correct		Taskaev, 1990;
			spruce trees 7-25-	134;Cs-				radial lines of xylem and		Kozubov et.al.,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			years old.	137;Sr-90;				phloem cells were formed.		1993.
				hot particles						
P8-1	Trees	Pinus	Area contaminated	Sr-90 - Y-90		(2-15)E-5		Mutation frequency in	CG	Kalchenko
		sylvestris	in 1957 as a result			Gy/day		fermental locus was 4,9E-3		et.al.,1993;
		<i>L</i> .	of the Kyshtym					per 1 locus. Rate of natural		Kalchenko et.al.,
		Scotch	accident. Mutations					mutagenesis in fermental		1995; Kalchenko,
		pine	in cells of pine trees					locus is (6,0-6,8)E-4		Spirin,1989;
			were studied.					mutation per 1 gene.		Altukhov et.al.,
			Number of trees							1983.
			analyzed - 30; total							
			number of							
			endosperms							
			analyzed - 2188.							
P8-2	Trees	Pinus	Area contaminated	Cs-137	(0,2-		0,5-10 Gy	Mutation frequency in	CG	Kalchenko
		sylvestris	as a result of the		20)E+6			fermental locus in pines		et.al.,1993;
		L.	Chernobyl		Bq/m2			from the Chernobyl zone		Kalchenko et.al.,
		Scotch	accident.Total					was 6,1E-3 per 1 locus.		1995; Kalchenko,
		pine	number of trees					Rate of natural		Spirin,1989;
			analyzed - 60. Total					mutagenesis of fermental		Altukhov et.al.,
			number of					locus is (6,0-6,8)E-4		1983.
			analyzed					mutation per 1 gene.		
			endosperms - 400.	~				x		
P9-1	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,7-2,4)E-	0,7-1,2 Gy	In 1987-1988, low pollen	MB	Kozubov,
		sylvestris	as a result of the	90, hot		3 Gy/day		viability was observed. In		Taskaev, 1994;
		L.	Chernobyl accident.	particles				1987, it was 58,9±3,9%		Kozubov,
		Scotch	Experimental plot					and in 1988 - 58,6±2,7%		Taskaev, 1990.
		pine	of pine forest at a					(1000000000000000000000000000000000000		
		Pollen	distance 3,5 km					(1987) and 89,7±1,1%	1	

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			from the ChNPP.					(1988)). In 1989, pollen		
			Total number of					viability was 82,1±2,3%		
			trees analyzed - 20.					(in the control $70,0\pm4,9\%$).		
			Trees were about							
			30 years old. Total							
			number of pollen-							
			grains were 6400							
			(in 1987), 8000 (in							
			1988) and 8000 (in							
			1989).							
P9-2	Trees	Pinus	Area contaminated	Cs-137, Sr-		(5-6)E-3	2,5-3,0 Gy	In 1987-1988, pollen	NE	Kozubov,
		sylvestris	as a result of the	90, hot		Gy/day		viability was the same as		Taskaev, 1994;
		L.	Chernobyl accident.	particles				in the control. In 1987, it		Kozubov,
		Scotch	Experimental plot					was 71,3±3,0% and in		Taskaev, 1990.
		pine	of pine forest in 6					1988 - 81,8±1,6% (in the		
		Pollen	km from NPP. In					control - $76,2\pm2,1\%$ (1987)		
			1987,1988 and					and 89,7±1,1% (1988)). In		
			1989 analyzed were					1989, pollen viability was		
			16,16 and 20 trees					$79,6\pm2,2\%$ (in the control		
			respectively. Trees					70,0±4,9%).		
			were 60 years old.							
			Total number of							
			pollen-grains							
			analyzed were 4400							
			(in 1987), 6400 (in							
			1988) and 8000 (in							
			1989).			ļ				
P9-3	Trees	Pinus	Area contaminated	Cs-137, Sr-		(9,6-12)E-	5-8 Gy	In 1987, pollen viability	MB	Kozubov,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	_		of	Gy/d			code	
NN of	-				surface	-				
record					soil					
					contamin					
					ation,					
					Bq/m2					
		sylvestris	as a result of the	90, hot		3 Gy/day		was 47,7±7,3% and in		Taskaev, 1994;
		Ĺ.	Chernobyl accident.	particles				1988 - 56,4±5,1% (in the		Kozubov,
		Scotch	Experimental plot	•				control - $76,2\pm2,1\%$ (1987)		Taskaev, 1990.
		pine	of pine forest at a					and 89,7±1,1% (1988)). In		
		Pollen	distance 4 km from					1989 pollen viability was		
			NPP. In 1987,1988					$63,8\pm5,4\%$ (in the control		
			and 1989 numbers					70,0±4,9%).		
			of trees analyzed					,		
			were 7,17 and 20							
			respectively. Trees							
			were 30 years old.							
			Total number of							
			pollen-grains							
			analyzed were 2800							
			(in 1987), 6800 (in							
			1988) and 8000(in							
			1989).							
P9-4	Trees	Pinus	Area contaminated	Cs-137, Sr-		(0,48-0,6)	20-25 Gv	High sterility of pollen	MB	Kozubov,
		svlvestris	as a result of the	90. hot		Gv/dav	5	grains (acute period). In		Taskaev, 1994:
		Ĺ.	Chernobyl accident.	particles		- 5		1989. pollen viability was		Kozuboy.
		Scotch	Experimental plot	L				65.6+7.0% (in the control		Taskaev, 1990.
		pine	of pine forest at					70,0±4,9%).		
		Pollen	distance 1.2-1.5 km					· · · · · · ·		
			from ChNPP.							
			Trees were 50-60							
			years old. Total							
			number of pollen-							
			grains analyzed -							

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P10-1	Trees	Pinus sylvestris L. Scotch pine	4000. Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest; 4 km from NPP.	Cs-137, Sr- 90, hot particles		(9,6-12)E- 3 Gy/day	5-8 Gy	In 1987, at the beginnig of formation of female gametophyte, 50% of seed-buds deteriorated by the end of meiosis (n=500). In October, 70% of seed-buds were necrotized (n=200).	MT	Kozubov, Taskaev, 1994; Kozubov, Taskaev, 1990.
P10-2	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest; 6 km from NPP.	Cs-137, Sr- 90, hot particles		(4,8-6,0)E- 3 Gy/day	2,5-3,0 Gy	In 1987, at the beginnig of formation of female gametophyte 30% of seed- buds deteriorated by the end of meiosis (n=500). In October, 50% of seed-buds were necrotized (n=200). On the second year of growth, 75% seed-buds were necrotized (n=100).	MT	Kozubov, Taskaev, 1994; Kozubov, Taskaev, 1990.
P10-3	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest; 3,5 km from NPP.	Cs-137, Sr- 90, hot particles		(1,7-2,4)E- 3 Gy/day	0,7-1,2 Gy	In October of 1987, about 5% of seed-buds were necrotized (n=200). On the second year, 20% seed- buds were necrotized (n=100).	MT	Kozubov, Taskaev, 1994; Kozubov, Taskaev, 1990.
P11-1	Trees	Pinus sylvestris L.	Area contaminated as a result of the Chernobyl accident.	Cs-137, Sr- 90, hot particles		(1,7-2,4)E- 3 Gy/day	0,7-1,2 Gy	In 1986, average number of seeds in one cone was 18,61 (in the control -	REP R	Kozubov, Taskaev, 1994; Kozubov,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Scotch	Experimental plot					21,32). In 1987, it was		Taskaev, 1990.
		pine	of pine forest; 3,5					11,38 (in the control -		
			km from NPP.					15,69). Since 1988,		
								differences were		
					-			statistically unreliable.		
P11-2	Trees	Pinus	Area contaminated	Cs-137, Sr-		(9,6-12)E-	5-8 Gy	In 1986, average number	MB	Kozubov,
		sylvestris	as a result of the	90, hot		3 Gy/day		of seeds in one cone was		Taskaev, 1994;
		L.	Chernobyl accident.	particles				8,90 (in the control -		Kozubov,
		Scotch	Experimental plot					21,32). Since 1988		Taskaev, 1990.
		pine	of pine forest; 4 km					differences were		
			from NPP.					statistically unreliable.		
P11-3	Trees	Pinus	Area contaminated	Cs-137, Sr-		(2,4-3,0)E-	10-12 Gy	In 1986, average number	MB	Kozubov,
		sylvestris	as a result of the	90, hot		2 Gy/day		of seeds in one cone was		Taskaev, 1994;
		L.	Chernobyl accident.	particles				6,78 (in the control -		Kozubov,
		Scotch	Experimental plot					21,32). Since 1988		Taskaev, 1990.
		pine	of pine forest in 5					differences were		
			km from NPP.	~				statistically unreliable.		
P11-4	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,7-2,4)E-	0,7-1,2 Gy	In 1986, germination of	REP	Kozubov,
		sylvestris	as a result of the	90, hot		3 Gy/day		seeds was 79% (in the	R	Taskaev, 1994;
		L.	Chernobyl accident.	particles				control - 90,05%). Since		Kozubov,
		Scotch	Experimental plot					1988 differences were		Taskaev, 1990.
		pine	of pine forest in 3,5					statistically unreliable.		
D11.5	-		km from NPP.	G 125 G						
P11-5	Trees	Pinus	Area contaminated	Cs-137, Sr-		(9,6-12)E-	5-8 Gy	In 1986, germination of	MB	Kozubov,
		sylvestris	as a result of the	90, hot		3 Gy/day		seeds was 33,6% (in the		Taskaev, 1994;
			Chernobyl accident.	particles				control - 90,05%).		Kozubov,
		Scotch	Experimental plot							Taskaev, 1990.
		pine	of pine forest in 4							

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
D11 (T	D'	km from NPP.	0 127 0			10.10.0			YZ 1
P11-6	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5 km from NPP.	Cs-137, Sr- 90, hot particles		(2,4-3,0)E- 2 Gy/day	10-12 Gy	In 1986, germination of seeds was 3% (in the control - 90,05%).	MI	Kozubov, Taskaev, 1994; Kozubov, Taskaev, 1990.
P12-1	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident.	Hot particles UOx		(1,9-2,7)E- 3 Gy/day	0,7-1,0 Gy	Stimulation of needles growth was observed. In 1986, mass of needles increased by a factor of 2 when compared with the year 1985 - 17,2 g in one shoot and 13,5 g, respectively.	STIM	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.
P12-2	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident.	Hot particles UOx		(4,0-5,5)E- 3 Gy/day	1,5-2,0 Gy	Mass of needles in one shoot was not changed. In 1985, it was 10 g and 1986 - 9,9 g. Length of needles decreased - $(43,9\pm2,2 \text{ mm} - \text{in} 1986)$ and 51,8±2,2 mm - in 1985).	NE	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.
P12-3	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident.	Hot particles UOx		(8,2- 11,0)E-3 Gy/day	3-4 Gy	In 1986 mass of needles per one shoot decreased when compared with the year 1985 - 5,9 g and 10,6 g, respectively.Average	MB	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
								length of needles		
								decreased - $(42,3\pm2,9 \text{ mm})$		
								- in 1986 and 52,6±1,3 mm		
								- in 1985).		
P12-4	Trees	Pinus	Area contaminated	Hot particles		(1,9-2,7)E-	0,7-1,0 Gy	In 1987, mass of needles	REP	Ladanova, 1994;
		sylvestris	as a result of the	UOx		3 Gy/day		increased by 15% (19,5 g	R	Karaban' et.al.,
		L.	Chernobyl accident.					in 1987 and 17,2 in 1986).		1979;
		Scotch						Length of needles		Tikhomirov,
		pine						increased - $(54,2\pm2,5 \text{ mm} - 1006 \text{ mm}$		1972.
								in 1986 and $60, 7\pm 1.9$ mm -		
								in 1987). In 1988-1991		
								increasing of length and		
								mass of shoots was		
D10.5	Trees	Dimo	A man a serie start	Hat monthalas		$(4055)\mathbf{E}$	15200-	observed.	DED	Ladamana 1004.
P12-5	Trees	Pinus	Area contaminated	Hot particles		(4,0-5,5)E-	1,5-2,0 Gy	In 1987, mass of needles	REP	Ladanova, 1994; Karahan' at al
		syivestris	as a result of the	UUX		5 Gy/day		increased by 40% (14,0 g	к	Karaban et.al.,
		L. Saotah	Chernobyl accident.					In 1987 and 9,9 In 1980).		1979, Tilehomirov
		scolch						increased (42.0+2.2 mm		1072
		pine						in 1086 and 57.7 \pm 2.6 mm		1972.
								in 1980 and $37,7\pm2,0$ mm -		
								increasing of length and		
								mass of shoots was		
								observed		
P12-6	Trees	Pinus	Area contaminated	Hot particles		(8.2-	3-4 Gv	In 1987 mass of needles	REP	Ladanova 1994.
1120	11005	svlvestris	as a result of the	UOx		11 0)E-3	5,0,	increased by 290%	R	Karaban' et al
		L	Chernobyl accident	COA		Gy/day		comparing with the	~	1979·
		Scotch	enemos ji ucerdent.			e j, auj		previous year (17 g in		Tikhomirov.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		pine						1987 and 5,9 in 1986).		1972.
								Length of needles		
								increased - $(42,3\pm2,9 \text{ mm} -$		
								in 1986 and 70,9±2,4 mm -		
								in 1987). In 1988-1991,		
								increasing of length and		
								mass of shoots was		
D10 5	-			**			20.25.0	observed.) (7	X 1 1001
P12-7	Trees	Pinus	Area contaminated	Hot particles		(5,5-6,8)E-	20-25 Gy	In 1986 central shoots and	MT	Ladanova, 1994;
		sylvestris	as a result of the	UUX		2 Gy/day		all needles died.		Karaban et.al.,
		L. Sector	Chernobyl accident.							1979; Til-ban-inan
		Scotch	Age of pines was							1 1Knomirov,
D12.9	Traca	pine Dimus	SU-OU years.	Hot montialas		(5569)E	20.25 Cr	In 1097 length of needles	DED	1972. Ladanava 1004:
P12-8	Trees	PINUS	Area contaminated	Hot particles		(3,3-0,8)E-	20-23 Gy	increased by a factor of 2	REP D	Ladanova, 1994; Karaban' at al
		I	Chernobyl accident	UUX		2 Oy/day		when compared with	ĸ	1070.
		L. Scotch	Age of pines was					normal (102 9+6.1 mm in		Tikhomirov
		nine	50-60 years					1987 and 56.5+2.5 mm in		1072
		pine	J0-00 years.					1987 and $50,5\pm2,5$ mm m 1985) In 1988 mass of		1972.
								needles increased by a		
								factor of 4 when		
								compared with 1987 (26.3		
								g in 1988 and 6.6 g in		
								1987).		
P12-9	Trees	Picea	Area contaminated	Hot particles		(4,7-6,0)E-	1,7-2,2 Gy	In 1986, mass of needles	MB	Ladanova, 1994;
		abies	as a result of the	UOx		3 Gy/day		decreased by 75% when		Karaban' et.al.,
		Common	Chernobyl accident.					compared with the year		1979;
		spruce	Age of spruces was					1985 -(0,9±0,1) g and		Tikhomirov,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
1cation NN of	organism	name			0I surface	Gy/d			code	
record					soil					
record					contamin					
					ation.					
					Bq/m2					
			40 years.		-			$(1,2\pm0,1)$ g, respectively.		1972.
								Length of needles		
								decreased - $(14,9\pm0,4 \text{ mm})$		
								- in 1986 and 19,8±0,8 mm		
								- in 1985).		
P12-	Trees	Picea	Area contaminated	Hot particles		(4,7-6,0)E-	1,7-2,2 Gy	In 1987, length of needles	REP	Ladanova, 1994;
10		abies	as a result of the	UOx		3 Gy/day		increased when compared	R	Karaban' et.al.,
		Common	Chernobyl accident.					with 1986 (26,6±1,0 mm		1979;
		spruce	Age of spruces was					in 1987 and $14,9\pm0,4$ mm		Tikhomirov,
			40 years.					in 1986). Since 1988		1972.
								differences of needle		
								length were statistically		
D10	T	D'	A	TT - ((1027)E	07100	unreliable.	MD	L 1
P12-	Trees	Picea	Area contaminated	Hot particles		(1,9-2,7)E-	0,7-1,0 Gy	In 1986, length of needles	MB	Ladanova, 1994; Karahan' at al
11		Common	as a result of the	UUX		5 Gy/uay		accreased by 9% when		
		spruce	Age of spruces was					$(12.7\pm0.5 \text{ mm in } 1986 \text{ and}$		Tikhomirov
		spruce	Age of spruces was					$(12,7\pm0,5)$ mm in 1985)		1072
P12-	Trees	Picea	Area contaminated	Hot particles		(4.0-5.5)F-	1 5-2 0 Gy	In 1986 average length of $13,9\pm0,3$ min in 1985).	MB	1972. Ladanova 1994:
12	11005	ahies	as a result of the	UOx		3 Gv/dav	1,5 2,0 Gy	needles decreased by 25%	MID	Karaban' et al
12		Common	Chernobyl accident	UUX		5 Gy/day		when compared with year		1979·
		spruce	Age of spruces was					1985 (10.5+0.4 mm in		Tikhomirov.
		sprace	40 years.					1986 and 14.3+0.4 mm in		1972.
								1985).		1772
P12-	Trees	Picea	Area contaminated	Hot particles		(8,2-	3,0-4,0 Gy	In 1986, average length of	MB	Ladanova, 1994;
13		abies	as a result of the	UOx		11,0)E-3		needles decreased by 25%		Karaban' et.al.,
		Common	Chernobyl accident.			Gy/day		when compared with year		1979;
		spruce	Age of spruces was					1985 (12,6±0,6 mm in		Tikhomirov,

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
			40 years.					1986 and $13,6\pm0,6$ mm m 1 1985).		1972.
P12- 14	Trees	Picea abies Common spruce	Area contaminated as a result of the Chernobyl accident. Age of spruces was 40 years.	Hot particles UOx		(4,0-5,5)E- 3 Gy/day	3,0-4,0 Gy	In 1987, reparation processes at spruce were observed. Average length of needles was 28,0±1,4 mm in 1987 and 13,6±0,6 mm in 1985. Since 1988, differences of needle length were statistically unreliable.	REP R	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.
P12- 15	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident.	Hot particles UOx		(1,1-1,4)E- 2 Gy/day	4-5 Gy	In 1987, needles on the pines were gigantic. Number of thilockoides in grains was higher then in the control $(4,74\pm0,20 \text{ in } 1987 \text{ and } 3,20\pm0,20 \text{ in the control}).$	MB	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.
P12- 16	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident.	Hot particles UOx		(1,9-2,7)E- 3 Gy/day	0,7-1,0 Gy	Number of chloroplasts in grains were lower then those in the control (in 1986 $(13,0\pm1,0)$ and $(16,7\pm0,8)$ in the control).	CG	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.
P12- 17	Trees	Picea abies Common spruce	Area contaminated as a result of the Chernobyl accident. Age of spruces was 7,10 and 25 years.	Hot particles UOx		(2,7-4,0)E- 3 Gy/day	1, 0 -1,5 Gy	Number of chloroplasts in grains were higher then those in the control (in 1986 (16,68 \pm 1,3) and (13,53 \pm 0,8) in the control).	CG	Ladanova, 1994; Karaban' et.al., 1979; Tikhomirov, 1972.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
1cation	organism	name			of	Gy/d			code	
ININ OI					surface					
record					sontamin					
					ation					
					Ba/m^2					
P12-	Trees	Picea	Area contaminated	Hot particles	Dq/III2	(27-40)E-	10-15 Gv	Numbers of grains in	CG	Ladanova 1994.
18	11005	ahies	as a result of the	UOx		3 Gv/day	1,0 1,5 05	chloroplast were lower	00	Karaban' et al
10		Common	Chernobyl accident.	0 OA		5 Oj/daj		then those in the control		1979:
		spruce	Age of spruces was					$(in 1986 (10.23 \pm 0.5))$ and		Tikhomirov.
		~	7.10 and 25 years.					(13.0 ± 1.0) in the control).		1972.
P12-	Trees	Picea	Area contaminated	Hot particles		(9,6-	3,5-4,0 Gy	In 1986, number of	CG	Ladanova, 1994;
19		abies	as a result of the	UOx		11,0)E-3	, , ,	chloroplasts were lower		Karaban' et.al.,
		Common	Chernobyl accident.			Gy/day		then those in the control		1979;
		spruce	Age of spruces was					(in 1986 (13,44±1,0) and		Tikhomirov,
		-	7,10 and 25 years.					$(20,04\pm1,2)$ in the control).		1972.
P13-1	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(1,0-		In 15 trees from 18	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	1,2)E-2		analysed, the leading		1996; Karaban'
		<i>L</i> .	Chernobyl accident.			Gy/day		shoots of 1986 were short.		et.al, 1977.
		Scotch	Experimental plot					In 2 samples from 18, the		
		pine	of pine forest in 5,5					leading shoots of 1986		
			km from NPP to the					died. One tree hadn't at		
			south-west.					all the leading shoot of		
								1986. In 14 trees from 18		
								studied, t the lateral shoots		
								of 1986 were absent. In all		
								trees studied there were no		
								lateral shoots of 1986 in		
								the lower crown parts.		
P13-2	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(8,4-		In 5 samples from 9	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	9,6)E-3		analyzed the leading		1996; Karaban'
		L.	Chernobyl accident.			Gy/day		shoots of 1986 were short.		et.al, 1977.
		Scotch	Experimental plot					In 3 samples the leading		
		pine	of pine forest in 5,8					shoot of 1986 died. In 4		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			km from NPP to the					samples the lateral shoots		
			south-west.					of 1986 in the upper crown		
								part were short. 5 samples		
								hadn't the lateral shoot of		
								1986. 8 trees hadn't the		
								lateral shoot of 1986 in		
								the middle crown part. 9		
								trees hadn't the lateral		
								shoot of 1986 in the lower		
								crown part.		
P13-3	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(5,0-		In 9 samples from 12	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	6,5)E-3		analyzed, the leading		1996; Karaban'
		L.	Chernobyl accident.			Gy/day		shoot of 1986 was short. In		et.al, 1977.
		Scotch	Experimental plot					8 samples, the lateral		
		pine	of pine forest in					shoots of 1986 in the upper		
			5,95 km from NPP					crown part were short.		
			to the south-west.							
P13-4	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(5,0-		In 8 samples from 13	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	6,5)E-3		studied, the leading shoot		1996; Karaban'
		L.	Chernobyl accident.			Gy/day		of 1986 was short. In 6		et.al, 1977.
		Scotch	Experimental plot					samples the lateral shoots		
		pine	of pine forest in 6,1					of 1986 in the upper crown		
			km from NPP to the					part were short. In 6		
			south-west.					samples the lateral shoots		
								of 1986 in the middle		
								crown part were short.		
P14-1	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(1,0-		In 1 samples from 18	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	1,2)E-2		analyzed, all needles of		1996; Karaban'

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
		L. Scotch pine	Chernobyl accident. Experimental plot of pine forest in 5,5 km from NPP to the south-west.			Gy/day		1984 and 1985 on the growth of 1987 were dark- brown.		et.al, 1977.
P14-2	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5,8 km from NPP to the south-west.	Hot particles UOx	(2-6)E+5 Bq/m2	(8,4- 9,6)E-3 Gy/day		In 7 samples from 9 analyzed, all needles of 1984 and 1985 on the growth of 1987 were fully yellow.	MB	Abaturov et.al., 1996; Karaban' et.al, 1977.
P14-3	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 5,95 km from NPP to the south-west.	Hot particles UOx	(2-6)E+5 Bq/m2	(5,0- 6,5)E-3 Gy/day		In 2 samples from 12 studied, the needles of 1984 and 1985 on the growth of 1987 in the middle crown part were fully yellow.	MB	Abaturov et.al., 1996; Karaban' et.al, 1977.
P14-4	Trees	Pinus sylvestris L. Scotch pine	Area contaminated as a result of the Chernobyl accident. Experimental plot of pine forest in 6,1 km from NPP to the south-west.	Hot particles UOx	(2-6)E+5 Bq/m2	(5,0-6,5)E- 3 Gy/day		In 3 samples from 13 analyzed, the needles of 1984 and 1985 on the growth of 1987 were fully yellow.	MB	Abaturov et.al., 1996; Karaban' et.al, 1977.
P14-5	Trees	Pinus sylvestris	Area contaminated as a result of the	Hot particles UOx	(2-6)E+5 Bq/m2	(2,0- 3,6)E-3		In 1 samples from 13 analyzed, the needles of	MB	Abaturov et.al., 1996; Karaban'

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		<i>L</i> .	Chernobyl accident.			Gy/day		1984 and 1985 in the		et.al, 1977.
		Scotch	Experimental plot					crown were yellow. In 6		
		pine	of pine forest in 6,4					samples the needles of		
			km from NPP to the					1984 and 1985 on the		
			south-west.					growth of 1987 in the		
								middle crown part were		
								fully yellow.		
P14-6	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(2,0-		In 6 samples from 15	MB	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	3,6)E-3		studied, the needles of		1996; Karaban'
		L.	Chernobyl accident.		_	Gy/day		1984 and 1985 on the		et.al, 1977.
		Scotch	Experimental plot					growth of 1987 in the		
		pine	of pine forest in 7					crown were fully yellow.		
			km from NPP to the							
			south-west.							
P15-1	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(2,0-		On the pines with strongly	ECO	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	3,6)E-3		damaged crowns, numbers	L	1996; Abaturov,
		<i>L</i> .	Chernobyl accident.			Gy/day		of alive shoots decreased		1990; Abaturov
		Scotch	June, 1988.					by 24% due to bark		et.al,1990.
		pine						beetles		
								(Tomicus(Blastophagus)		
								piniperda L.).In autumn,		
								1988 and spring 1989-		
								1990, enhanced of injury		
								of shoots by bark beetles		
								were not observed.		
P15-2	Trees	Pinus	Area contaminated	Hot particles	(2-6)E+5	(2,0-		In autumn 1988, numbers	ECO	Abaturov et.al.,
		sylvestris	as a result of the	UOx	Bq/m2	3,6)E-3		of Aradus cinnamomeus	L	1996; Abaturov,
		<i>L</i> .	Chernobyl accident.			Gy/day		Panz. increased in the		1990; Abaturov

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Scotch	June, 1988.					area. Individual trees had		et.al,1990.
		pine						yellow needles on the end		
								of branches. This was		
								typical sign of damages		
								caused by Aradus		
								cinnamomeus Panz.		
								Numbers of Aradus		
								cinnamomeus Panz.		
								exceeded 10 spec/dm2 (up		
								to 40 spec/dm2). On the		
								health trees damages		
								caused by Aradus		
								cinnamomeus Panz. were		
								not observed.		
P16-1	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		6,0E-4		Mutant plants amounted to	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day		27,3±6,0% of analyzed		1995.
		thaliana	Chernobyl accident.	particles				plants. Spontaneous level		
		(L.)	Experimental plot					of mutations in natural		
		Heynh.	located near the					non-exposed populations is		
			settlement Tolsty					(1-5)%.		
			Les. Total number							
			of analyzed plants							
			was 55. 1987.							
P16-2	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		4,0E-3		Mutant plants amounted to	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day		42,0±7,0%. Spontaneous		1995.
		thaliana	Chernobyl accident.	particles				level of mutations in		
		(L.)	Experimental plot					nature non-exposed		
		Heynh.	located near the					populations is (1-5)%.		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
			-		Bq/m2					
			settlement							
			Shepelichi. Total							
			number of analyzed							
			plants was 50.							
D16 2	Harbaaaa	Anghidan	1987.	Co 127 Sr		5 9E 2		Number of mutant plants	CC	A hearmony at al
F10-5	Herbaceo	Arabiaop	Area contaminated	CS-157, SI-		5,0E-2 Gy/day		Number of mutant plants was $80.8+5.4\%$	CG	Adramov et.al,
	us	sis thaliana	Chernobyl accident	particles		Gy/day		Spontaneous level of $\frac{1}{2}$		1995.
		(I)	Experimental plot	particles				mutations in natural non-		
		(L.) Heynh	located near the					exposed populations is (1-		
		110 yruu.	settlement Yanov-4.					5)%.		
			Total number of					0,701		
			analyzed plants was							
			52. 1987.							
P16-4	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		3,1E-2	7,88	Number of mutant plants	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day	Gy/year	was 78,3±5,3%.		1995.
		thaliana	Chernobyl accident.	particles			(1989).	Spontaneous level of		
		(L.)	Experimental plot					mutations in nature non-		
		Heynh.	located near the					exposed populations is (1-		
			settlement Yanov-6.					5)%.		
			Total number of							
			analyzed plants was							
			60. 1988.	~			0.50		~~	
P16-5	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		2,4E-3	0,79	Number of mutant plants	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day	Gy/year	was 44,2±6,7%.		1995.
		thaliana	Chernobyl accident.	particles			(1989).	Spontaneous level of		
		(L.)	Experimental plot					mutations in nature non-		
		Heynh.	located near the					exposed populations is (1-		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2		_	5.0/		
			Settlement					5)%.		
			snepericni. Total							
			number of analyzed							
			1988.							
P16-6	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		4,8E-4	0,12	Number of mutant plants	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day	Gy/year	was 47,0±5,0%.		1995.
		thaliana	Chernobyl accident.	particles			(1989).	Spontaneous level of		
		(L.)	Experimental plot					mutations in nature non-		
		Heynh.	located near the					exposed populations is (1-		
			settlement Tolsty					5)%.		
			Les. Total number							
			of analyzed plants							
DICE			was 100. 1988.	G 105 G		0.45.4	0.10			
P16-7	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		3,4E-4	0,12	Number of mutant plants	CG	Abramov et.al,
	us		as a result of the	90, hot		Gy/day	Gy/year	was $4,0\pm 2,0\%$.		1995.
		thallana	Experimental plat	particles			(1989).	Spontaneous level of		
		(L.) Howeh	located page the					avposed populations is (1		
		meynn.	settlement Tolsty					5)% Next years number of		
			Les Total number					mutant plants not		
			of analyzed plants					decreased		
			was 100. 1989.							
P16-8	Herbaceo	Arabidop	Area contaminated	Cs-137, Sr-		2,2E-3	0,79	Number of mutant plants	CG	Abramov et.al,
	us	sis	as a result of the	90, hot		Gy/day	Gy/year	was 25,5±2,9%.		1995.
		thaliana	Chernobyl accident.	particles			(1989).	Spontaneous level of		
		(L.)	Experimental plot					mutations in nature non-		
		Heynh.	located near the					exposed populations is (1-		

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
			Shepelichi. Total number of analyzed plants was 55. 1989.					of mutant plants decreased.		
P16-9	Herbaceo us	Arabidop sis thaliana (L.) Heynh.	Area contaminated as a result of the Chernobyl accident. Experimental plot located near the settlement Yanov-6. Total number of analyzed plants was 60. 1988.	Cs-137, Sr- 90, hot particles		2,2E-2 Gy/day	7,88 Gy/year (1989).	Number of mutant plants was 40,0±4,9%. Spontaneous level of mutations in nature non- exposed populations is (1- 5)%. Next years numbers of mutant plants decreased.	CG	Abramov et.al, 1995.
P17-1	Herbaceo us	Dactylis glomerat a L. Cocksfoo t	Area contaminated as a result of the Chernobyl accident. 1986.	Hot particles UOx		1,9E-2 Gy/day		In 1986, seed germination of Dactylis glomerata L. was 3,7±0,9. Total number of seeds studied was 1000.	MB	Shershunova, Zainullin, 1995; Shershunova et.al.,1993.
P17-2	Herbaceo us	Dactylis glomerat a L. Cocksfoo t	Area contaminated as a result of the Chernobyl accident. 1986.	Hot particles UOx		(4,8-6,0)E- 2 Gy/day	> 20 Gy	In 1986, none of the 300 seeds sprouted up.	MT	Shershunova, Zainullin, 1995; Shershunova et.al.,1993.
P17-3	Herbaceo us	Dactylis glomerat a L. Cocksfoo	Area contaminated as a result of the Chernobyl accident. 1988.	Cs-137, Sr- 90, hot particles		(1,7- 2,9)E-3 Gy/day (in 1988)	4,2-5,5 Gy (in 1986)	In 1988, none of the 1000 seeds spouted up.	MT	Shershunova, Zainullin, 1995; Shershunova et.al.,1993.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
ININ OI					surface					
lecolu					sontamin					
					ation					
					Ba/m ²					
-		t			Dq/III2					
P17-4	Herbaceo	Dactvlis	Area contaminated	Cs-137. Sr-		(2.4-4.8)E-		In 1988, seed germination	REP	Shershunova.
	us	glomerat	as a result of the	90, hot		5 Gy/day		was 20,7%. Total number	R	Zainullin, 1995;
		a L.	Chernobyl accident.	particles		(in 1988)		of seeds studied was 1000.		Shershunova
		Cocksfoo	1988.	•						et.al.,1993.
		t								
P17-5	Herbaceo	Dactylis	Area contaminated	Cs-137, Sr-		(4,8-		In 1988, germination of	REP	Shershunova,
	us	glomerat	as a result of the	90, hot		1440)E-6		seeds varied from	R	Zainullin, 1995;
		a L.	Chernobyl accident.	particles		Gy/day		$0,7\pm0,3\%$ to $(13,0\pm1,2)\%$.		Shershunova
		Cocksfoo	1989.					Total number of seeds		et.al.,1993.
		t t		G 105 G		(1.0) E. 2		analyzed was 1000.		
P17-6	Herbaceo	Dactylis	Area contaminated	Cs-137, Sr-		(1-3)E-2		In 1987, a peak of	CG	Shershunova,
	us	glomerat	as a result of the	90, hot		Gy/day		chlorophyll mutations was		Zainullin, 1995;
		a L.	Chernobyl accident.	particles				observed. Mutation		Shershunova
		Cocksjoo	1987.					1 20)%		et.al.,1995.
P18-1	Herbaceo	ı Crenis	Area contaminated	Cs-137 Sr-		$(1.2-1.7)E_{-}$		In 1988 germination of	RED	Shevchenko et al
1 10-1		tectorum	as a result of the	90 hot		4 Gv/day		seeds was $383+24\%$ (in	R	1995
	ub	L	Chernobyl accident.	particles		(1988):		the control $51.1+1.7\%$). In	I.	1775.
			1988-1989.	Purcheres		1.2E-5		1989. germination of		
						Gy/day		seeds was $42.8 \pm 3.4\%$ (in		
						(1989)		the control $47,3\pm1,3\%$).		
P18-2	Herbaceo	Crepis	Area contaminated	Cs-137, Sr-		(1,7-		In 1988, germination of	REP	Shevchenko et.al.,
	us	tectorum	as a result of the	90, hot		2,2)E-3		seeds was 53,2±2,7% (in	R	1995.
		<i>L</i> .	Chernobyl accident.	particles		Gy/day		the control $51,1\pm1,7\%$). In		
			1988-1989.			(1988);		1989, germination of		
						1,7E-3		seeds was 37,8±4,7% (in		
						Gy/day		the control $47,3\pm1,3\%$).		

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
D10.2	XX 1	<i>a</i> .		G 107 G		(1989).		L 1000	DED	
P18-3	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident. 1988-1989.	Cs-137, Sr- 90, hot particles		(1,4-1,9)E- 2 Gy/day (1988); (1,2-1,7)E- 2 Gy/day (1989).		In 1988, germination of seeds was $40,1\pm1,2\%$ (in the control $51,1+1,7\%$). In 1989, germination of seeds was $46,4\pm2,0\%$ (in the control $47,3\pm1,3\%$).	REP R	Shevchenko et.al., 1995.
P18-4	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident. 1988-1989. Population of Crepis tectorum L. was irradiated by acute gamma- radiation with dose 20 Gy.	Cs-137, Sr- 90, hot particles		1,8E-2 Gy/day		A frequency of cells with chromosomal aberrations induced by acute irradiation was $8,2\pm0,6\%$ (in the control $10,4\pm0,5\%$). Total number of cells studied was 2159 (in the control - 3598).	CG	Shevchenko et.al., 1995.
P18-5	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident. 1988-1989.	Cs-137, Sr- 90, hot particles		(1,2-1,7)E- 4 Gy/day (1988); 1,2E-5 Gy/day (1989).		In 1988, a frequency of karyotypic changes was $2,9\pm1,7\%$ (in the control - 0%). In 1989, a frequency of karyotypic changes was $3,7\pm2,1\%$ (in the control - $0,3\pm0,2\%$).	CG	Shevchenko et.al., 1995.
P18-6	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident. 1988-1989.	Cs-137, Sr- 90, hot particles		(1,7-2,2)E- 3 Gy/day (1988); 1,7E-3		In 1988, a frequency of karyotypic changes was 6,2±2,3% (in the control - 0%). In 1989, a frequency	CG	Shevchenko et.al., 1995.
Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
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					ation, Ba/m2					
						Gy/day (1989).		of karyotypic changes was $4,5\pm2,2\%$ (in the control - $0,3\pm0,2\%$).		
P18-7	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident. 1988-1989.	Cs-137, Sr- 90, hot particles		(1,4-1,9)E- 2 Gy/day (1988); (1,2-1,7)E- 2 Gy/day(19 89).		In 1988, a frequency of karyotypic changes was $1,3\pm0,6\%$ (in the control - 0%). In 1989, a frequency of karyotypic changes was $1,7\pm0,8\%$ (in the control - $0,3\pm0,2\%$).	CG	Shevchenko et.al., 1995.
P19-1	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	5E+6 Bq/m2	3,7E-5 Gy/day	0,4 Gy	In 1966, number of cells with chromosomal aberrations in the first mitosis of seed germs was 125% of the control.	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P19-2	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	60E+6 Bq/m2	4,6E-4 Gy/day	5,0 Gy	In 1966, number of cells with chromosomal aberrations in the first mitosis of seed germs was 150% of the control.	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P19-3	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	140E+6 Bq/m2	7,8E-4 Gy/day	8,5 Gy	In 1966, number of cells with chromosomal aberrations in the first mitosis of seed germs was 175% of the control.	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
P19-4	Herbaceo	Centaure	Area contaminated	Sr-90 - Y-90	5E+6	3,7E-5	0,4 Gy	Higher radioresistance of	CG	Kalchenko et.al.,
	us	а	in 1957 as a result		Bq/m2	Gy/day		chronically irradiated		1995; Kalchenko
		scabiosa	of the Kyshtym					seeds was observed		et.al., 1983.
		<i>L</i> .	accident.					compared with the control		
		Centaury	Population of					population . Percentage r		
		scabiose	Centaurea scabiosa					of cells with chromosomal		
			L. was additionally					aberrations in the first		
			irradiated by acute					mitosis of seed germs was		
			gamma-radiation					30% (in the control -		
			with dose 10 Gy.					43%).		
P19-5	Herbaceo	Centaure	Area contaminated	Sr-90 - Y-90	60E+6	4,6E-4	5,0 Gy	Higher radioresistance of	CG	Kalchenko et.al.,
	us	а	in 1957 as a result		Bq/m2	Gy/day		chronically irradiated		1995; Kalchenko
		scabiosa	of the Kyshtym		_			seeds was observed		et.al., 1983.
		<i>L</i> .	accident.					compared with the control		
		Centaury	Population of					population. Percentage of		
		scabiose	Centaurea scabiosa					cells with chromosomal		
			L. was additionally					aberrations in the first		
			irradiated by acute					mitosis of seed germs was		
			gamma-radiation					27% (in the control -		
			with dose 10 Gy.					43%).		
P19-6	Herbaceo	Centaure	Area contaminated	Sr-90 - Y-90	140E+6	7,8E-4	8,5 Gy	Higher radioresistance of	CG	Kalchenko et.al.,
	us	а	in 1957 as a result		Bq/m2	Gy/day	-	chronically irradiated		1995; Kalchenko
		scabiosa	of the Kyshtym					seeds was observed		et.al., 1983.
		<i>L</i> .	accident.					compared with the control		
		Centaury	Population of					population. Percentage of		
		scabiose	Centaurea scabiosa					cells with chromosomal		
			L. was additionally					aberrations in the first		
			irradiated by acute					mitosis of seed germs was		

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
			with dose 10 Gy.					43%).		
P19-7	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	60E+6 Bq/m2	4,6E-4 Gy/day	5,0 Gy	Number of chlorophyll mutations was by a factor of 3,2 higher then the control values $(0,48\pm0,13\%$ and $0,15\pm0,07\%$ - in the control).	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P19-8	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	140E+6 Bq/m2	7,8E-4 Gy/day	8,5 Gy	Number of chlorophyll mutations was by a factor of 14,5 higher then the control values $(2,17\pm0,26\%$ and $0,15\pm0,07\%$ - in the control).	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P19-9	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	5E+6 Bq/m2	3,7E-5 Gy/day	0,4 Gy	Mutation frequency in Lap locus in populations of Centaurea scabiosa L. was 7,8E-3 per 1 locus (in the control - 5,4E-4/ locus).	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P19- 10	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	60E+6 Bq/m2	4,6E-4 Gy/day	5,0 Gy	Mutation frequency in Lap locus in populations of Centaurea scabiosa L. was 40E-3 per 1 locus (in the control - 5,4E-4/ locus).	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
					ation, Bq/m2					
P19- 11	Herbaceo us	Centaure a scabiosa L. Centaury scabiose	Area contaminated in 1957 as a result of the Kyshtym accident.	Sr-90 - Y-90	140E+6 Bq/m2	7,8E-4 Gy/day	8,5 Gy	Mutation frequency in Lap locus in populations of Centaurea scabiosa L. was 66E-3 per 1 locus (in the control - 5,4E-4/ locus).	CG	Kalchenko et.al., 1995; Kalchenko et.al., 1983.
P20-1	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident (Bryansk region). July,1992. Total number of germs studied was 52. Total number of cells analyzed was 1017.	Cs-137, Sr- 90.		(3,6-4,8)E- 3 Gy/day (1992) in 7 years after the acute irradiation		Numbers of cells with chromosomal aberrations were $1,6\pm0,4\%$ (in the control $0,1\%$).	CG	Shevchenko, Grinikh, 1995; Shevchenko et.al., 1995.
P20-2	Herbaceo us	Crepis tectorum L.	Area contaminated as a result of the Chernobyl accident (Bryansk region). July,1992. Total number of germs studied was 32. Total number of cells analyzed was 926.	Cs-137, Sr- 90.		(3,6-4,8)E- 2 Gy/day (1992) in 7 years after the acute irradiation		Numbers of cells with chromosomal aberrations were $5,2\pm0,7\%$ (the control 0,1%).	CG	Shevchenko, Grinikh, 1995; Shevchenko et.al., 1995.
P20-3	Herbaceo us	Crepis tectorum	Area contaminated as a result of the	Cs-137, Sr- 90.		(4,0-6,0)E- 2 Gy/day		Numbers of cells with chromosomal aberrations	CG	Shevchenko, Grinikh, 1995;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
		T	Channel 1 and 1 and		Bq/m2	(1002) : 7		2.7.0.50/ (4)	-	
		L.	(Demonstrate maxim)			(1992) in /		were $2,7\pm0,5\%$ (the		Snevcnenko et.al.,
			(Bryansk region).			years after		control 0,1%).		1995.
			July,1992. Total			irradiation				
			studied was 62			Inaulation				
			Total number of							
			cells analyzed was							
			1209.							
P20-4	Herbaceo	Crepis	Area contaminated	Cs-137, Sr-		(6,0-7,2)E-		Numbers of cells with	CG	Shevchenko,
	us	tectorum	as a result of the	90.		2 Gy/day		chromosomal aberrations		Grinikh, 1995;
		<i>L</i> .	Chernobyl accident			(1992) in 7		were 0,7±0,3% (control		Shevchenko et.al.,
			(Bryansk region).			years after		0,1%).		1995.
			July,1992. Total			the acute				
			number of germs			irradiation				
			studied was 55.							
			Total number of							
			cells analyzed was							
D01 1	TT 1	.	826.	G 127 G		(2.2			00	
P21-1	Herbaceo	Fragaria	Area contaminated	Cs-137, Sr-		(2,2-	(5-40)E-4	Numbers of cells with	CG	Shevchenko et.al.,
	us	vesca L.	as a result of the	90.		18,3)E-/	Gy	chromosomal aberrations 0.2 ± 0.20 (the		1996.
		wild strawbor	(Pryonaly ragion)			(1002) in 7		were $0,2\pm 0,2\%$ (the		
		ry	Total number of			(1992) III /		control 0,1 %).		
		<i>Ty</i>	germs studied was			the acute				
			137 Total number			irradiation				
			of cells analyzed			intudiation				
			was 606. 1992.							
P21-2	Herbaceo	Hypocho	Area contaminated	Cs-137, Sr-		(2,2-	(5-40)E-4	Numbers of cells with	CG	Shevchenko et.al.,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
	us	eris	as a result of the	90.		18,3)E-7	Gy	chromosomal aberrations		1996.
		radicata	Chernobyl accident			Gy/day		were 0,6±0,2% (control		
		<i>L</i> .	(Bryansk region).			(1992) in 7		0,1%).		
			Total number of			years after				
			germs studied was			the acute				
			46. Total number of			irradiation				
			cells analyzed was							
			1640. 1992.							
P21-3	Herbaceo	Genista	Area contaminated	Cs-137, Sr-		(2,2-	(5-40)E-4	Numbers of cells with	CG	Shevchenko et.al.,
	us	pilosa L.	as a result of the	90.		18,3)E-7	Gy	chromosomal aberrations		1996.
		Genista	Chernobyl accident			Gy/day		were $0,2\pm0,1\%$ (the control		
			(Bryansk region).			(1992) in 7		0,1%).		
			Total number of			years after				
			germs studied was			the acute				
			126. Total number			irradiation				
			of cells analyzed							
			was 1971. 1992.							
P21-4	Trees	Pinus	Area contaminated	Cs-137, Sr-		(2,2-	(5-40)E-4	Numbers of cells with	CG	Shevchenko et.al.,
		sylvestris	as a result of the	90.		18,3)E-7	Gy	chromosomal aberrations		1996.
		L. Scotch	Chernobyl accident			Gy/day		were 0,2±0,1% (the		
		pine	(Bryansk region).			(1992) in 7		control 0,1%).		
			Total number of			years after				
			germs studied was			the acute				
			14. Total number of			irradiation				
			cells analyzed was							
			1796. 1992.							
P21-5	Herbaceo	Fragaria	Area contaminated	Cs-137, Sr-		(2,3-3,5)E-	(50-76)E-4	Numbers of cells with	CG	Shevchenko et.al.,
	us	vesca L.	as a result of the	90.		6 Gy/day	Gy	chromosomal aberrations		1996.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Wild	Chernobyl accident			(1992) in 7		were 0,1±0,1% (the		
		strawber	(Bryansk region).			years after		control 0,1%).		
		ry	Total number of			the acute				
			germs studied was			irradiation				
			129. Total number							
			of cells analyzed							
			was 1365. 1992.	G 125 G					<u> </u>	
P21-6	Herbaceo	Hypocho	Area contaminated	Cs-137, Sr-		(2,3-3,5)E-	(50-76)E-4	Numbers of cells with	CG	Shevchenko et.al.,
	us	eris	as a result of the	90.		6 Gy/day	Gy	chromosomal aberrations		1996.
		radicata	Chernobyl accident			(1992) in 7		were $0.6\pm 0.2\%$ (the		
		L.	(Bryansk region).			years after		control 0,1%).		
			I otal number of			the acute				
			germs studied was			irradiation				
			42. Total number of							
			cells analyzed was							
D21 7	Harbaaaa	Conjeta	1572. 1992.	Co 127 Sr		(2,2,2,5)E	(50 76)E 4	Numbers of colls with	CC	Shavahanka at al
P21-7	Herbaceo	Genisia viloga I	Area contaminated	CS-157, SI-		$(2,3-3,3)E^{-}$	(30-70)E-4	shromosomal shorestions	CG	
	us	pilosa L.	as a result of the	90.		0 Gy/day	Gy	chromosomar aberrations $\frac{1}{2}$ ware 0.6 ± 0.20 (the control		1990.
		Genisia	(Devenuely reasion)			(1992) III /		were $0.0\pm0.5\%$ (the control		
			(Bryansk region).			the acute		0,1%).		
			forms studied was			irradiation				
			40 Total number of			inaciation				
			cells analyzed was							
			525 1992							
P21-8	Trees	Pinus	Area contaminated	Cs-137 Sr		(2 3-3 5)F	(50-76)E 4	Numbers of cells with	CG	Shevchenko et al
121-0	11005	1 mus	as a result of the	00		$(2, 3^{-}3, 3)$ L-	Gv	chromosomal aberrations		1006
1				-/ 1 /						

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
		nina	(Drange ragion)		Бq/III2	voors ofter		aontrol 0.1%		
		pine	(Di yalisk legioli).			the acute		control 0,1 %).		
			germs studied was			irradiation				
			50 Total number of			inadiation				
			cells analyzed was							
			5973. 1992.							
P21-9	Trees	Pinus	Area contaminated	Cs-137, Sr-		(1,4-2,7)E-	0,5-1,0 Gy	Numbers of chromosomal	CG	Shevchenko et.al.,
		sylvestris	as a result of the	90, hot		3 Gy/day		aberrations in pine seeds		1996.
		L. Scotch	Chernobyl accident.	particles				was 1,5±0,3% (the control		
		pine	Total number of					1,0±0,4%).		
			cells was 1128.							
			1987.							
P21-	Trees	Pinus	Area contaminated	Cs-137, Sr-		(5,5-6,8)E-	2,0-2,5 Gy	Number of chromosomal	CG	Shevchenko et.al.,
10		sylvestris	as a result of the	90, hot		3 Gy/day		aberrations in pine seeds		1996.
		L. Scotch	Chernobyl accident	particles				was $2,1\pm0,6\%$ (the control		
		pine	. Total number of 5.62					1,0±0,4%).		
			cells was 505.							
D21	Troos	Dinus	Area contaminated	Cs 137 Sr		(1 4 2 1)E	5075Gv	Number of chromosomal	CG	Shavehanko at al
11	TICCS	sylvestris	as a result of the	90 hot		(1, 4-2, 1)L- 2 Gy/day	5,0-7,5 Gy	aberrations in pine seeds	CU	1006
11		I Scotch	Chernobyl accident	particles		2 Gy/day		was $4.3\pm0.7\%$ (the control		1770.
		pine	Total number of	purcheres				1.0+0.4%).		
		puic	cells was 692.					1,0_0,1707.		
			1987.							
P21-	Trees	Pinus	Area contaminated	Cs-137, Sr-		2,7E-2	10 Gy	Number of chromosomal	CG	Shevchenko et.al.,
12		sylvestris	as a result of the	90, hot		Gy/day		aberrations in pine seeds		1996.
		L. Scotch	Chernobyl accident.	particles				was 7,2 \pm 1,0% (the control		
		pine	Total number of					1,0±0,4%).		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
1cation NN of	organism	name			0I surface	Gy/d			code	
record					soil					
iccolu					contamin					
					ation					
					Ba/m ²					
			cells was 690		Dq/III2					
			1987.							
P22-1	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	1,85E+5	5,5E-6		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (metaphase		1998.
		<i>L</i> .	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was 0,78±0,29% (the		
			895. July, 1995.					control 0,01±0,05%).		
P22-2	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	3,7E+6	9,6E-5		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (metaphase		1998.
		<i>L</i> .	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was $0,46\pm0,26\%$ (the		
D22		<i>a</i> .	655. July, 1995.	G 00 X 00				control 0,01±0,05%).		
P22-3	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	7,4E+6	2,0E-4		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (metaphase		1998.
		L.	of the Kyshtym					analysis) in Crepis		
			accident. I otal					tectorum L. populations		
			number of cells was					was $0.59\pm0.21\%$ (the		
D22 4	Harbasas	Cuaria	1507. July, 1995.	Sr 00 V 00	0.25E+6			Eraquanay of chromosome	CC	Shavaharka at al
r22-4	nerbaceo	teetomum	in 1057 as a result	51-90 - 1-90	9,23E+0 Ba/m2	2,4E-4		aborrations (materials		
	us	I	of the Kyshtym		bq/III2	Gy/uay		aberrations (metaphase		1770.
		L.	accident Total					tectorum L populations		
			number of cells was					$was 0.50\pm0.19\%$ (the		
			1392 July 1995					control 0.01+0.05%		
P22-5	Herbaceo	Crenis	Area contaminated	Sr-90 - Y-90	1 85E+7	4 8F-4		Frequency of chromosome	CG	Shevchenko et al
1 22 3		tectorum	in 1957 as a result	51 70 1 70	Ba/m2	Gv/dav		aberrations (metaphase		1998
	us	tectorum	in 1957 as a result		вq/m2	Gy/day		aberrations (metaphase		1998.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		<i>L</i> .	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was1,45±0,35% (the		
			1174. July, 1995.					control 0,01±0,05%).		
P22-6	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	1,85E+7	5,5E-6		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (anaphase		1998.
		<i>L</i> .	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was 2,10±0,51% (the		
			808. July, 1995.					control 0,75±0,16%).		
P22-7	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	3,7E+6	9,6E-5		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (anaphase		1998.
		<i>L</i> .	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was 1,54±0,46% (the		
			714. July, 1995.					control 0,75±0,16%).		
P22-8	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	7,4E+6	2,0E-4		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (anaphase		1998.
		L.	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was 1,23±0,37% (the		
			894. July, 1995.					control 0,75±0,16%).		
P22-9	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	9,25E+6	2,4E-4		Frequency of chromosome	CG	Shevchenko et.al.,
	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (anaphase		1998.
		L.	of the Kyshtym					analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was 1,51±0,47% (the		
1			663. July, 1995.					control 0,75±0,16%).		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d	-		code	
NN of	-				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	1,85E+7	4,8E-4		Frequency of chromosome	CG	Shevchenko et.al.,
10	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		aberrations (anaphase		1998.
		<i>L</i> .	of the Kyshtym		1	5 5		analysis) in Crepis		
			accident. Total					tectorum L. populations		
			number of cells was					was $2,68\pm0,61\%$ (the		
			708. July, 1995.					control 0,75±0,16%).		
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	1,85E+5	5,5E-6		Changes of radioresistance	CG	Shevchenko et.al.,
11	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		of chronicle exposure plant		1998.
		<i>L</i> .	of the Kyshtym		-			populations were not		
			accident.					revealed. Frequency of		
			Population of					chromosome aberrations		
			Crepis tectorum L.					in Crepis tectorum L.		
			was additionally					populations was		
			irradiated by acute					$15,97\pm0,77\%$ (the control		
			gamma-radiation					16,46±0,99%).		
			with dose 20 Gy.							
			Total number of							
			cells was 2235.							
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	3,7E+6	9,6E-5	1	Changes of radioresistance	CG	Shevchenko et.al.,
12	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		of chronicle exposure plant		1998.
		<i>L</i> .	of the Kyshtym		1	5 5		populations were not		
			accident.					revealed. Frequency of		
			Population of					chromosome aberrations in		
			Crepis tectorum L.					Crepis tectorum L.		
			was additionally					populations was		
			irradiated by acute					$14,71\pm0.96\%$ (the control		
			gamma-radiation					16,46±0,99%).		
			with dose 20 Gy.							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			Total number of							
			cells was 1353.							
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	7,4E+6	2,0E-4		Changes of radioresistance	CG	Shevchenko et.al.,
13	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		of chronicle exposure plant		1998.
		<i>L</i> .	of the Kyshtym					populations were not		
			accident.					revealed. Frequency of		
			Population of					chromosome aberrations		
			Crepis tectorum L.					in Crepis tectorum L.		
			was additionally					populations was		
			irradiated by acute					$17,5/\pm0,75\%$ (the control		
			gamma-radiation					16,46±0,99%).		
			with dose 20 Gy.							
			Total number of							
Daa	** 1	<i>a</i> .	cells was 2561.	G 00 ¥/00	0.055	2 45 4			00	
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	9,25E+6	2,4E-4		Changes of radioresistance	CG	Shevchenko et.al.,
14	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		of chronicle exposure plant		1998.
		L.	of the Kyshtym					populations were not		
			accident.					revealed. Frequency of		
			Population of					chromosome aberrations		
			Crepis tectorum L.					in Crepis tectorum L.		
			was additionally					populations was		
			irradiated by acute					$16,0/\pm0,88\%$ (the control		
			gamma-radiation					10,40±0,99%).		
			with dose 20 Gy.							
			1 otal number of							
Daa	XX 1	<i>a</i> .	cells was 1/1/.	G 00 V 00	1.055.5	4.05.4			00	01 1 1 1 1
P22-	Herbaceo	Crepis	Area contaminated	Sr-90 - Y-90	1,85E+6	4,8E-4		Changes of radioresistance	CG	Shevchenko et.al.,
15	us	tectorum	in 1957 as a result		Bq/m2	Gy/day		of chronicle exposure plant		1998.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		<i>L</i> .	of the Kyshtym					populations were not		
			accident.					revealed. Frequency of		
			Population of					chromosome aberrations		
			Crepis tectorum L.					in Crepis tectorum L.		
			was additionally					populations was		
			irradiated by acute					$15,58\pm1,50\%$ (the control		
			gamma-radiation					16,46±0,99%).		
			with dose 20 Gy.							
			1 otal number of							
D22_1	Harbaaaa	Cingium	Cells was 584.				(200, 1400)	Species diversity	ECO	Sminnor
P23-1	Herbaceo	Cirsium	Acute gamma-				(200-1400)	Species diversity	ECO	SIMITIOV
	us	setosum,	irradiation of				Gy	Energy 50 energies in the	L	et.al.,1985.
		Sonchus	May 20 June 0					From 59 species in the		
		arvensis	1070 A stivity of					experimental plot only 8		
		SOW-	1979. Activity of					remained in the irradiated		
		nusue, Bostingo	$11800E + 12 P_{a}$					plot.		
		Festinac	$T_{000E+12}$ By.							
		u	Zone of strong							
		Parenin	uannage (1-7 m).							
		Potentill								
		I Olemini a								
		anserina								
		Cinquefo								
		il								
		Alopecur								
		us								
		pratensis								

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Meadow								
		foxtail,								
		Poa								
		pratensis								
		Fowl-								
		grass						~		~ .
P23-2	Herbaceo	Meadow	Acute gamma-				(25-200)	Species diversity	ECO	Smirnov
	us	plants	irradiation of				Gy	decreased by a factor of 2.	L	et.al.,1983.
			meadow plants.					From 59 species in the		
			May,29 - June,9,					experimental plot only 25		
			19/9. Activity of					remained in the irradiated		
			US-157 Was					piot.		
			11800E+12 Bq.							
			domogo (7.22 m)							
D23 3	Harbacao	Maadow	A cuto gamma				(0.25) Gy	Spacias divarsity did not	NE	Smirnov
r 23-3	lieibaceo	nlants	irradiation of				(0-23) Gy	changed From 60 species	INL	at a1 1083
	us	pianis	meadow plants					in the experimental plot		ct.al.,1705.
			May 20 June 0					50 remained in the		
			1070 Activity of					irradiated plot		
			Cs-137 was					inadiated plot.		
			11800F+12 Ba							
			Zone of slight							
			damage (23-80 m)							
P23-4	Herbaceo	Meadow	Acute gamma-				(200-1400)	From 14 prepotent species.	ECO	Smirnov
	us	plants	irradiation of				Gy	9 died.	L	et.al.,1983.
			meadow plants.				5			.,
			May,29 - June,9,							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d			code	
NN of	U				surface	2				
record					soil					
					contamin					
					ation,					
					Bq/m2					
			1979. Activity of		-					
			Cs-137 was							
			11800E+12 Bq.							
			Zone of strong							
			damage (1-7 m).							
			In 60 days after							
			exposure.							
P23-5	Herbaceo	Agropyru	Acute gamma-				(200-1400)	Number of Agropyrum	ECO	Smirnov
	us	m repens	irradiation of				Gy	repens plants sharply	L	et.al.,1983.
		Spear-	meadow plants.					decreased (20±1 piece/m2;		
		grass	May,29 - June,9,					and 156±33 piece/m2 in		
			1979. Activity of					the control).		
			Cs-137 was							
			11800E+12 Bq.							
			Zone of strong							
			damage (1-7 m).							
			In 60 days after							
			exposure.							
P23-6	Herbaceo	Potentill	Acute gamma-				(200-1400)	Number of Potentilla	ECO	Smirnov
	us	а	irradiation of				Gy	anserina, Cirsium setosum,	L	et.al.,1983.
		anserina	meadow plants.					Sonchus arvensis increased		
		Cinquefo	May,29 - June,9,					$(10\pm2 \text{ piece/m2 and } 5)$		
		il,	1979. Activity of					piece/m2 in the control -		
		Cirsium	Cs-137 was					Cirsium setosum; 12±2		
		setosum,	11800E+12 Bq.					piece/m2 and 2 piece/m2		
		Sonchus	Zone of strong					in the control - Potentilla		
		arvensis	damage (1-7 m).					anserina; 12±2 piece/m2		
		Sow-	In 60 days after					and 3 piece/m2 in the		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		thistle	exposure.					control - Sonchus arvensis		
P23-7	Herbaceo	Meadow	Acute gamma-				(25-200)	From 14 prepotent species,	ECO	Smirnov
	us	plants	irradiation of				Gy	5 died.	L	et.al.,1983.
			meadow plants.							
			May,29 - June,9,							
			1979. Activity of							
			Cs-137 was							
			11800E+12 Bq.							
			Zone of average							
			damage (7-23 m).							~ .
P23-8	Herbaceo	Potentill	Acute gamma-				93-200 Gy	Displacement of	ECO	Smirnov
	us	a	irradiation of					phenophase was observed.	L	et.al.,1983.
		anserina	meadow plants.							
		Cinquefo	May,29 - June,9,							
		il,	19/9. Activity of							
		Cirsium	Cs-137 was							
		setosum,	11800E+12 Bq.							
		Sonchus								
		arvensis								
		Sow-								
		thistle,								
		POd								
		praiensis								
		r Owl-								
		grass,								
		Alopecur								
		14.5		1		1	1	1	1	

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d			code	
NN of	_				surface	-				
record					soil					
					contamin					
					ation,					
					Bq/m2					
		Meadow								
		foxtail,								
		Glaux								
		maritima								
P23-9	Herbaceo	Potentill	Acute gamma-				105-1400	Repeated blossoming was	ECO	Smirnov
	us	а	irradiation of				Gy	observed.	L	et.al.,1983.
		anserina	meadow plants.							
		Cinquefo	May,29 - June,9,							
		il	1979. Activity of							
			Cs-137 was							
			11800E+12 Bq.							
P23-	Herbaceo	Potentill	Acute gamma-				25 Gy	Morphological changes of	MB	Smirnov
10	us	а	irradiation of					Potentilla anserina were		et.al.,1983.
		anserina	meadow plants.					observed (curliness of		
		Cinquefo	May,29 - June,9,					leaves).		
		il	1979. Activity of							
			Cs-137 was							
			11800E+12 Bq.							
P23-	Herbaceo	Potentill	Acute gamma-				73 Gy	Morphological changes of	MB	Smirnov
11	us	a	irradiation of					Potentilla anserina were		et.al.,1983.
		anserina	meadow plants.					observed (burn and die of		
		Cinquefo	May,29 - June,9,					tendrils).		
		il	1979. Activity of							
			Cs-137 was							
			11800E+12 Bq.							
P24-1	Herbaceo	Plantago	Area contaminated	Hot particles		(1,2-4,8)E-		Numbers of abnormal	MB	Popova, Frolova,
	us	Lanceola	as a result of the	UOx		5 Gy/day		germs in family was		1993; Frolova
		ta L.	Chernobyl accident.			(August,		$14,2\pm4,3\%$ (number of		et.al., 1989;

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
		Rib- grass	1988.			1986)		germs analysed - 492).		Frolova et.al., 1991; Frolova, Popova,1990; Frolova et.al., 1990.
P24-2	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		(4,8-12)E- 5 Gy/day (August, 1986)		Number of abnormal germs in family was 26,0±5,2% (number of investigated germs was 871).	MB	Popova, Frolova, 1993; Frolova et.al., 1989; Frolova et.al., 1991; Frolova, Popova,1990; Frolova et.al., 1990.
P24-3	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		1,2E-3 Gy/day (August, 1986)		Numbers of abnormal germs in family were 23,1±4,4% (number of investigated germs was 475).	MB	Popova, Frolova, 1993; Frolova et.al., 1989; Frolova et.al., 1991; Frolova, Popova,1990; Frolova et.al., 1990.
P24-4	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		3,6E-2 Gy/day (August, 1986)		Numbers of abnormal germs in family were 31,7±6,7% (number of investigated germs was 542).	MB	Popova, Frolova, 1993; Frolova et.al., 1989; Frolova et.al., 1991; Frolova, Popova,1990; Frolova et.al.,

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P24-5	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		4,8E-2 Gy/day (August, 1986)		Number of abnormal germs in family was 21,0±3,9 (number of investigated germs was 256).	MB	1990. Popova, Frolova, 1993; Frolova et.al., 1989; Frolova et.al., 1991; Frolova, Popova,1990; Frolova et.al., 1990.
P25-1	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		(1,2-4,8)E- 5 Gy/day (August, 1986)		Numbers of families with abnormal germs were 68% (total number of families was 25).	MB	Frolova et.al., 1993; Popova, Frolova, 1996; Popova et.al., 1993.
P25-2	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		(4,8-12)E- 5 Gy/day.		Numbers of families with abnormal germs were 96% (total number of families analysed was 25).	MB	Frolova et.al., 1993; Popova, Frolova, 1996; Popova et.al., 1993.
P25-3	Herbaceo us	Plantago Lanceola ta L. Rib- grass	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		1,2E-3 Gy/day (August, 1986)		Numbers of families with abnormal germs were 84% (total number of families was 25).	MB	Frolova et.al., 1993; Popova, Frolova, 1996; Popova et.al., 1993.
P25-4	Herbaceo us	Plantago Lanceola ta L. Rib-	Area contaminated as a result of the Chernobyl accident. 1988.	Hot particles UOx		3,6E-2 Gy/day (August, 1986)		Numbers of families with abnormal germs were 84% (total number of families was 25).	MB	Frolova et.al., 1993; Popova, Frolova, 1996; Popova et.al.,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d	_		code	
NN of	-				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		grass			1					1993.
P25-5	Herbaceo	Plantago	Area contaminated	Hot particles		4.8E-2		Numbers of families with	MB	Frolova et.al.,
	us	Lanceola	as a result of the	UOx		Gv/dav		abnormal germs were 88%		1993: Popova.
		ta L.	Chernobyl accident.			(August.		(total number of families		Frolova, 1996:
		Rib-	1988.			1986)		was 17).		Popova et.al.,
		grass				,				1993.
P26-1	Herbaceo	Viola	Area contaminated	Cs-137, Sr-		9.6E-6		Germination of Viola	NE	Popova et.al.,
	us	matutina	as a result of the	90, hot		Gy/day		matutina Klok. seeds in the		1994.
		Klok.	Chernobyl accident.	particles		(May,1987		experimental plot was 26%		
		Violet	1987-1988.	1				(in the laboratory -		
						,		21,0±8,0%).		
P26-2	Herbaceo	Viola	Area contaminated	Cs-137, Sr-		(3,6-		Germination of Viola	NE	Popova et.al.,
	us	matutina	as a result of the	90, hot		4,8)E-3		matutina Klok. seeds in the		1994.
		Klok.	Chernobyl accident.	particles		Gy/day		experimental plot was 37%		
		Violet	1987-1988.	1		(May,1987		(in the laboratory -		
)		35,3±2,7%).		
P26-3	Herbaceo	Viola	Area contaminated	Cs-137, Sr-		9,6E-6		In 1988 pollen sterility in	ADA	Popova et.al.,
	us	matutina	as a result of the	90, hot		Gy/day		plants from experimental	Р	1994.
		Klok.	Chernobyl accident.	particles		(May,1987		plot was 17,6±2,8%		
		Violet	1987-1988.	-)		(number of pollen-grain		
								analyzed was 53980). In		
								1991 pollen sterility in		
								plants in the laboratory		
								was 34,1±2,6% (number of		
								pollen grains analyzed		
								was 34640).		
P26-4	Herbaceo	Viola	Area contaminated	Cs-137, Sr-		(3,6-		In 1988 pollen sterility in	ADA	Popova et.al.,
	us	matutina	as a result of the	90, hot		4,8)E-3		plants from experimental	Р	1994.

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
		Klok. Violet	Chernobyl accident. 1987-1988.	particles		Gy/day (May,1987)		plot was $41,3\pm3,8\%$ (number of pollen-grain analyzed was 40470). In 1991 pollen sterilityin plants in the laboratory was $17,9\pm2,5\%$ (number of pollen grain analyzed was 33370).		
P27-1	Trees	Betula verrucos a Ehrh. Birch	Acute gamma- irradiation of birch seeds. Dose rate of point source of Cs- 137 was 8658 R/h.				400 Gy	Germination of Betula verrucosa Ehrh. seeds was (25-90)% (the control - about 100%).	MB	Pozolotina,1980; Kiseliova, Yushkov, 1977; Mamaev, Govorukha,1973; Makhnev,1971; Makhnev,1978.
P27-2	Trees	Betula verrucos a Ehrh. Birch	Acute gamma- irradiation of birch seeds. Dose rate of point source of Cs- 137 was 8658 R/h.				400 Gy	Survival of Betula verrucosa Ehrh. seedlings was 18-38% (in the control - about 100%).	MB	Pozolotina,1980; Kiseliova, Yushkov, 1977; Mamaev, Govorukha,1973; Makhnev,1971; Makhnev,1978.
P27-3	Trees	Betula pubescen s Ehrh. Birch	Acute gamma- irradiation of birch seeds. Dose rate of point source of Cs- 137 was 8658 R/h.				400 Gy	Germination of Betula pubescens Ehrh. seeds was (35-82)% (in the control - about 85%).	MB	Pozolotina,1980; Kiseliova, Yushkov, 1977; Mamaev, Govorukha,1973; Makhnev,1971;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
										Makhnev,1978.
P27-4	Trees	Betula	Acute gamma-				400 Gy	Survival of Betula	MB	Pozolotina,1980;
		pubescen	irradiation of birch					pubescens Ehrh. seedlings		Kiseliova,
		s Ehrh.	seeds. Dose rate of					was 30-60% (in the control		Yushkov, 1977;
		Birch	point source of Cs-					- about 90%).		Mamaev,
			137 was 8658 R/h.							Govorukha,1973;
										Makhnev,1971;
										Makhnev,1978.
P28-1	Trees	Betula	Acute gamma-				100,150	Irradiation of seeds did not	NE	Pozolotina,1985.
		verrucos	irradiation of birch				and 200	changed such parameters		
		a Ehrh.	seeds. Seeds were				Gy	as length of shoot, number		
		Birch	colected in different					and magnitude of leaves.		
			plots of birch forest.					_		
			Dose rate of point							
			source was 1,5							
			Gy/sec.							
P28-2	Trees	Betula	Acute gamma-				200 Gy	Short lateral shoots on the	MB	Pozolotina,1985.
		verrucos	irradiation of birch					trees were observed.		
		a Ehrh.	seeds. Seeds were							
		Birch	colected in different							
			plots of birch forest.							
			Dose rate of point							
			source was 1,5							
			Gy/sec.							
P28-3	Trees	Betula	Acute gamma-				200 Gy	Survival of seedlings from	MB	Pozolotina,1985.
		verrucos	irradiation of birch				-	irradiated seeds was 18% (
		a Ehrh.	seeds. Seeds were					the control - 46%).		
		Birch	colected in different							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d			code	
NN of	U				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			plots of birch forest.		-					
			Dose rate of point							
			source was 1,5							
			Gy/sec.							
P28-4	Trees	Betula	Acute gamma-				100 Gy	Seedlings irradiated in 1	MT	Pozolotina,1985.
		verrucos	irradiation of birch					month of age totally died		
		a Ehrh.	seeds. Seeds were					during the wintering.		
		Birch	colected in different							
			plots of birch forest.							
			Dose rate of point							
			source was 1,5							
			Gy/sec.							
P28-5	Trees	Betula	Acute gamma-				50 Gy	Survival of seedlings	NE	Pozolotina,1985.
		verrucos	irradiation of birch				-	irradiated in 1 month of		
		a Ehrh.	seeds. Seeds were					age was 44% (the control		
		Birch	colected in different					46%).		
			plots of birch forest.					,		
			Dose rate of point							
			source was 1,5							
			Gy/sec.							
P28-6	Trees	Betula	Acute gamma-				75 Gy	Survival of seedlings	MT	Pozolotina,1985.
		verrucos	irradiation of birch				-	irradiated in 1 month of		
		a Ehrh.	seeds. Seeds were					age was 10% (the control		
		Birch	colected in different					46%).		
			plots of birch forest.							
			Dose rate of point							
			source was 1,5							
			Gy/sec.							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
P28-7	Trees	Betula	Acute gamma-				50 Gy	Growth of 1-year seedlings	REP	Pozolotina, 1985.
		verrucos	irradiation of birch					reduced comparing with	R	
		a Ehrh.	seeds. Seeds were					the control. Growth of		
		Birch	collected in different					shoot was 70% of the		
			plots of birch forest.					control.		
			Dose rate of point							
			source was 1,5							
D78 8	Troos	Rotula	Aguta gamma				75 Gu	Growth of 1 year soudlings	DED	Pozolotina 1085
r 20-0	TIEES	verrucos	irradiation of birch				75 Gy	reduced comparing with	R	r 02010tilla, 1965.
		a Fhrh	seeds Seeds were					the control Growth of	IX .	
		Rirch	colected in different					shoots was 30% of the		
		Diren	plots of birch forest					control		
			Dose rate of point					controll		
			source was 1.5							
			Gy/sec.							
P28-9	Trees	Betula	Acute gamma-				50 Gy	In 2 months after the	REP	Pozolotina,1985.
		verrucos	irradiation of birch					irradiation post-radiation	R	
		a Ehrh.	seeds. Seeds were					renewal of birch seedlings		
		Birch	colected in different					was observed. Growth of		
			plots of birch forest.					leading shoots resumed.		
			Dose rate of point					Leaves formed on the new		
			source was 1,5					shoots had an accurate		
			Gy/sec.					form and normal size.		
P29-1	Trees	Betula	Acute gamma-				250-300	On the stage of leaves	MT	Pozolotina,
		pendula	irradiation of birch				Gy	formation germs of Betula		Kulikov, 1988.
		Roth.	seeds. Dose rate of					pendula Roth. fully died.		
		Birch	point source of Co-							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			60 was 0,695							
			Gy/sec.							
P29-2	Trees	Betula	Acute gamma-				175 Gy	Survival of Betula	MB	Pozolotina,
		pendula	irradiation of birch					pendula Roth. germs was		Kulikov, 1988.
		Roth.	seeds. Dose rate of					80% (the control - 96%).		
		Birch	point source of Co-							
			60 was 0,695							
			Gy/sec.							
P29-3	Trees	Betula	Acute gamma-				200 Gy	Survival of Betula	MB	Pozolotina,
		pendula	irradiation of birch					pendula Roth. germs was		Kulikov, 1988.
		Roth.	seeds. Dose rate of					67% (the control - 96%).		
		Birch	point source of Co-							
			60 was 0,695							
			Gy/sec.							
P29-4	Trees	Betula	Acute gamma-				175 Gy	In the first season after	MB	Pozolotina,
		pendula	irradiation of birch					exposure length of shoots		Kulikov, 1988.
		Roth.	seeds. Dose rate of					was 3-4 times lower then		
		Birch	point source of Co-					in the control $(1,8\pm0,1 \text{ cm})$		
			60 was 0,695					- on the irradiated plants		
			Gy/sec.					and $5,5\pm+0,2$ cm - on the		
								control).		
P29-5	Trees	Betula	Acute gamma-				200 Gy	In first season after	MB	Pozolotina,
		pendula	irradiation of birch					exposure length of shoots		Kulikov, 1988.
		Roth.	seeds. Dose rate of					was in 3-4 times lower		
		Birch	point source of Co-					then on the control		
			60 was 0,695					(1,2+0,1 cm - in the)		
			Gy/sec.					irradiated plants and		
								5,5±0,2 cm - in the		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
								control).		
P29-6	Trees	Betula	Acute gamma-				175 Gy	In 2-3 years after the	MB	Pozolotina,
		pendula	irradiation of birch					exposure lengths of shoots		Kulikov, 1988.
		Roth.	seeds. Dose rate of					were 1,5-2 times lower		
		Birch	point source of Co-					then those in the control		
			60 was 0,695					(7,8±0,3 cm - in the		
			Gy/sec.					irradiated plants and		
								12,2±0,2 cm - in the		
								control).		
P29-7	Trees	Betula	Acute gamma-				200 Gy	In 2-3 years after the	MB	Pozolotina,
		pendula	irradiation of birch					exposure lengths of shoots		Kulikov, 1988.
		Roth.	seeds. Dose rate of					was in 1,5-2 times lower		
		Birch	point source of Co-					then those in the control		
			60 was 0,695					$(5,6\pm0,3 \text{ cm} - \text{in the})$		
			Gy/sec.					irradiated plants and		
								12,2±0,2 cm - in the		
								control).		
P30-1	Herbaceo	Taraxacu	Area contaminated	Cs-137, Sr-		(4,8-22)E-		Radioresistence of	MB	Pozolotina et.al.,
	us	m	as a result of the	90, hot		5 Gy/day.		Taraxacum officinale		1991;
		officinale	Chernobyl accident.	particles				Wigg. from Chernobyl		Pozolotina,1989;
		Wigg.	1988. Experimental					was lower then that in the		Pozolotina,1990;
		Dandelio	plot located in					control. Survival of		Taskaev et.al.,
		n	Chernobyl. Seeds					Taraxacum officinale		1988.
			of Taraxacum					Wigg. was 44,3±6,4% (
			officinale Wigg.					the control - $92,4\pm 2,8\%$).		
			was additionally							
			exposed to gamma-							
			radiation (point							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			source of Co-60) in							
			doses 100-150 Gy.							
P30-2	Herbaceo	Taraxacu	Area contaminated	Cs-137, Sr-		(7,2-46)E-		Radioresistance of	MB	Pozolotina et.al.,
	us	т	as a result of the	90, hot		4 Gy/day.		Taraxacum officinale		1991;
		officinale	Chernobyl accident.	particles				Wigg. from Yanov was		Pozolotina,1989;
		Wigg.	1988. Experimental					lower then that in the		Pozolotina,1990;
		Dandelio	plot located in					control. Survival of		Taskaev et.al.,
		n	Yanov. Seeds of					Taraxacum officinale		1988.
			Taraxacum					Wigg. was 34,0±2,4% (
			officinale Wigg.					the control - $92,4\pm 2,8\%$).		
			was additionally							
			exposed to gamma-							
			radiation (point							
			source of Co-60) in							
			doses 100-150 Gy.							
P30-3	Herbaceo	Taraxacu	Area contaminated	Cs-137, Sr-		(4,8-22)E-		Germination of Taraxacum	MB	Pozolotina et.al.,
	us	т	as a result of the	90, hot		5 Gy/day.		officinale Wigg. seeds was		1991;
		officinale	Chernobyl accident.	particles				$63,6\pm2,8\%$ (the control -		Pozolotina,1989;
		Wigg.	1988. Experimental					94,4±2,5%).		Pozolotina,1990;
		Dandelio	plot located in							Taskaev et.al.,
		n	Chernobyl. Seeds							1988.
			of Taraxacum							
			officinale Wigg.							
			was additionally							
			exposed to gamma-							
			radiation (point							
			source of Co-60) in							
			doses 100-150 Gy.							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
D 20 4	** 1	-		G 127 G	Bq/m2	(7.2.40)				D 1
P30-4	Herbaceo	Taraxacu	Area contaminated	Cs-137, Sr-		(7,2-46)E-		Germination of Taraxacum	MB	Pozolotina et.al.,
	us	m	as a result of the	90, not		4 Gy/day.		officinale wigg. seeds was $40.0 \pm 2.40\%$ (the control		1991; Depeileding 1080;
		Wing	1088 Experimental	particles				$40,0\pm 2,4\%$ (the control -		Pozolotina, 1989;
		Wigg.	plot located in					94,4±2,3%).		Fozoiotilla, 1990, Taskaay at al
		Dunueno	Vanov Seeds of							1088
		n	Taraxacum							1700.
			officinale Wigg.							
			was additionally							
			exposed to gamma-							
			radiation (point							
			source of Co-60) in							
			doses 100-150 Gy.							
P30-5	Herbaceo	Taraxacu	Area contaminated	Cs-137, Sr-		(4,8-22)E-		From 15000 germs of	NE	Pozolotina et.al.,
	us	m	as a result of the	90, hot		5 Gy/day.		Taraxacum officinale		1991;
		officinale	Chernobyl accident.	particles				Wigg. number of plants		Pozolotina,1989;
		Wigg.	1988. Experimental					with visible changes was		Pozolotina,1990;
		Dandelio	plot located in					0,14%. Moreover, 40% of		Taskaev et.al.,
		n	Chernobyl.					damages were adnate		1988.
Datit	** 1	-		a		(1.5		twins.		
P31-1	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	85,5E+3	(1,7-		Radioresistance of	MB	Pozolotina et.al.,
	us	m	1n 1957 as a result		Bq/m2	2,6)E-3		Taraxacum officinale		1992.
		officinale	of the Kyshtym			Gy/day		wigg.seeds from plot		
		Wigg.	accident.					located near lake 1 ygish		
		Danaelio	Experimental plot					was nigher then in the		
		n	was located in 90					Control. Survival of		
			KIII IFOID KYSIIIYM					Wigg After probing		
			near lake Tygish in					wigg. After probing		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			birch forest.					radiation exposure was		
			Concentration of					$60,7\pm3,8\%$ (in the control -		
			Sr-90 in soil was					40,3±3,4%).		
			600 Bq/kg. Seeds of							
			l araxacum							
			officinale wigg.							
			were additionally							
			approved to probing							
			(point source of Co							
			(point source of Co- 60).1990.							
P31-2	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	1,7E+3	(1,7-2,6)E-		Radioresistance of	STIM	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	3 Gy/day		Taraxacum officinale		1992.
		officinale	of the Kyshtym		•			Wigg.seeds from plot		
		Wigg.	accident.					located in a forest near		
		Dandelio	Experimental plot					settlement Rassokha was		
		n	located in a forest					higher then in the control.		
			near settlement					Survival of Taraxacum		
			Rassokha.					officinale Wigg. after		
			Concentration of					probing radiation exposure		
			Sr-90 in soil was 90					was 50,7±1,7% (in the		
			Bq/kg. Seeds of					control - 40,3±3,4%).		
			Taraxacum							
			officinale Wigg.							
			were additionally							
			exposed to probing							
			gamma-radiation							
1			(point source of Co-							

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
					$\frac{1000}{1000}$					
			60) 1990		Dq/III2					
P31-3	Herbaceo us	Taraxacu m officinale Wigg. Dandelio n	Area contaminated in 1957 as a result of the Kyshtym accident. Experimental plot located in 90 km from Kyshtym near lake Tygish in birch forest. Concentration of Sr-90 in soil was 600 Bq/kg. Seeds of Taraxacum officinale Wigg. were additionally exposed to probing gamma-radiation (point source of Co- 60) with Dose rate of 1156	Sr-90-Y-90	85,5E+3 Bq/m2	(1,7-2,6)E- 3 Gy/day		Frequency of chromosomal aberrations in Taraxacum officinale Wigg. seeds was 19,8±3,1% (in the control - 5,2±2,2%).	CG	Pozolotina et.al., 1992.
P31-4	Herbaceo us	Taraxacu m officinale Wigg. Dandelio n	Area contaminated in 1957 as a result of the Kyshtym accident. Experimental plot located in a forest	Sr-90-Y-90	1,7E+3 Bq/m2	(1,7- 2,6)E-3 Gy/day		Frequency of chromosomal aberrations in Taraxacum officinale Wigg. seeds was 11,1±2,2% (in the control - 5,2±2,2%).	CG	Pozolotina et.al., 1992.

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of	-				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			near settlement							
			Rassokha.							
			Concentration of							
			Sr-90 in soil was 90							
			Bq/kg. Seeds of							
			Taraxacum							
			officinale Wigg.							
			were additionally							
			exposed to probing							
			gamma-radiation							
			(point source of Co-							
			60). 1990.							
P32-1	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	31,0E+3	(1,7-		Germination of	MB	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	2,6)E-3		Taraxacum officinale		1996;
		officinale	of the Kyshtym			Gy/day		Wigg. seeds was		Molchanova et.al,
		Wigg.	accident.					72,6±3,4% (the control -		1994.
		Dandelio	Concentration of					86,3±3,4%).		
		n	Sr-90 in soil was							
			400 Bq/kg.1992.							
P32-2	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	85,5E+3	(1,7-		Germination of	MB	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	2,6)E-3		Taraxacum officinale		1996;
		officinale	of the Kyshtym			Gy/day		Wigg. seeds was		Molchanova et.al,
		Wigg.	accident.					63,0±8,8% (the control -		1994.
		Dandelio	Concentration of					86,3±3,4%).		
		n	Sr-90 in soil was							
			600 Bq/kg. 1992.							
P32-3	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	22,7E+3	(1,7-		Germination of	MB	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	2,6)E-3		Taraxacum officinale	1	1996;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d	_		code	
NN of	-				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		officinale	of the Kyshtym			Gy/day		Wigg. seeds was		Molchanova et.al,
		Wigg.	accident.					$74,5\pm3,6\%$ (the control -		1994.
		Dandelio	Concentration of					86,3±3,4%).		
		n	Sr-90 in soil was							
			200 Bq/kg.1992.							
P32-4	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	31,0E+3	(1,7-		Frequency of	CG	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	2,6)E-3		chromosomal aberrations		1996;
		officinale	of the Kyshtym			Gy/day		in Taraxacum officinale		Molchanova et.al,
		Wigg.	accident.					Wigg. seeds was 2,0±0,8%		1994.
		Dandelio	Concentration of					(the control - $2,9\pm1,1\%$).		
		n	Sr-90 in soil was							
			400 Bq/kg.1992.							
P32-5	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	85,5E+3	(1,7-		Frequency of	CG	Pozolotina et.al.,
	us	т	in 1957 as a result		Bq/m2	2,6)E-3		chromosomal aberrations		1996;
		officinale	of the Kyshtym			Gy/day		in Taraxacum officinale		Molchanova et.al,
		Wigg.	accident.					Wigg. seeds was 4,6±1,1%		1994.
		Dandelio	Concentration of					(the control - $2,9\pm1,1\%$).		
		n	Sr-90 in soil was							
			600 Bq/kg. 1992.							
P32-6	Herbaceo	Taraxacu	Area contaminated	Sr-90-Y-90	22,7E+3	(1,7-		Frequency of	CG	Pozolotina et.al.,
	us	m	in 1957 as a result		Bq/m2	2,6)E-3		chromosomal aberrations		1996;
		officinale	of the Kyshtym			Gy/day		in Taraxacum officinale		Molchanova et.al,
		Wigg.	accident.					Wigg. seeds was 6,1±0,7%		1994.
		Dandelio	Concentration of					(the control - $2,9\pm1,1\%$).		
		n	Sr-90 in soil was							
			200 Bq/kg.1992.							
P33-1	Herbaceo	Taraxacu	Area contaminated	Sr-90, Cs-	63,4E+3	8,0E-6		Numbers of cells with	CG	Pozolotina, 2001.
	us	т	in 1957 as a result	137	Bq/m2	Gy/day		chromosomal aberrations		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		officinale	of the Kyshtym		(Sr-90);			were 5,11±1,62% (the		
		<i>s.l</i> .	accident.		5,0E+3			control - 1,18±0,60%).		
		Dandelio	Experimental plot		Bq/m2					
		n	located near lake		(Cs-137)					
			Tygish.							
			Concentration of							
			Sr-90 in 0-5 cm							
			layer of soil was							
			646E+3 Bq/kg.							
		_	1998.	~ ~ ~ ~					~~	D
P33-2	Herbaceo	Taraxacu	Area contaminated	Sr-90, Cs-	711,6E+	1,0E-4		Numbers of cells with	CG	Pozolotina, 2001.
	us	m	in 1957 as a result	137	3 Bq/m2	Gy/day		chromosomal aberrations		
		officinale	of the Kyshtym		(Sr-90);			were $8,55\pm 2,42\%$ (the		
		S.L.	accident.		2506,6E			control - $1,18\pm0,60\%$).		
		Danaello	Experimental plot		+3					
		n	iocated on the right		$\frac{Dq}{III2}$					
			Shore of river		(CS-157)					
			Concentration of							
			Concentration of $S_{\rm r}$ 00 in 0.5 cm							
			SI-90 III 0-3 CIII							
			1348E+3 Balka							
			1998							
P33-3	Herbaceo	Taraxacu	Area contaminated	Sr-90 Cs-	63 4E+3	8.0E-6		Germination of	MB	Pozolotina 2001
1000	us	m	in 1957 as a result	137	Ba/m2	Gy/day		Taraxacum officinale s.l.		2 0201011111, 2001.
		officinale	of the Kyshtym		(Sr-90):			seeds was 49.3% (3.2-		
		s.l.	accident.		5.0E+3			85,2%) (the control -		
		Dandelio	Experimental plot		Bq/m2			84,1%(37,2-94,0)).		

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d	-		code	
NN of	U				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
		n	located near lake		(Cs-137)					
			Tygish.							
			Concentration of							
			Sr-90 in 0-5 cm							
			layer of soil was							
			646E+3 Bq/kg.							
			1998.							
P33-4	Herbaceo	Taraxacu	Area contaminated	Sr-90, Cs-	711,6E+	1,0E-4		Germination of	MB	Pozolotina, 2001.
	us	m	in 1957 as a result	137	3 Bq/m2	Gy/day		Taraxacum officinale s.l.		
		officinale	of the Kyshtym		(Sr-90);			seeds was 60,9% (45,2-		
		<i>s.l</i> .	accident.		2506,6E			76,8%). In the control -		
		Dandelio	Experimental plot		+3			84,1%(37,2-94,0)).		
		n	located on the right		Bq/m2					
			shore of river		(Cs-137)					
			Techa.							
			Concentration of							
			Sr-90 in 0-5 cm							
			layer of soil was							
			4348E+3 Bq/kg.							
			1998.							
P33-5	Herbaceo	Taraxacu	Area contaminated	Sr-90, Cs-	63,4E+3	8,0E-6		Survival of Taraxacum	MB	Pozolotina, 2001.
	us	m	in 1957 as a result	137	Bq/m2	Gy/day		officinale s.l. was 43,6%		
		officinale	of the Kyshtym		(Sr-90);			(2,8-82,8%). lin the		
		s.l.	accident.		5,0E+3			control - 65,8% (37,2-		
		Dandelio	Experimental plot		Bq/m2			94,0).		
		n	located near lake		(Cs-137)					
			Tygish.							
1			Concentration of							

Identif ication NN of record	Type of organism	Latin name	Impact Sr-90 in 0-5 cm layer of soil was 646E+3 Bq/kg. 1998.	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P33-6	Herbaceo us	Taraxacu m officinale s.l. Dandelio n	Area contaminated in 1957 as a result of the Kyshtym accident. Experimental plot located on the right shore of river Techa. Concentration of Sr-90 in 0-5 cm layer of soil was 4348E+3 Bq/kg. 1998.	Sr-90, Cs- 137	711,6E+ 3 Bq/m2 (Sr-90); 2506,6E +3 Bq/m2 (Cs-137)	1,0E-4 Gy/day		Survival of Taraxacum officinale s.l. was 56,8% (18,8-72,8%). In the control - 65,8%(37,2- 94,0).	MB	Pozolotina, 2001.
P33-7	Herbaceo us	Taraxacu m officinale s.l. Dandelio n	Area contaminated in 1957 as a result of the Kyshtym accident. Experimental plot located near lake Tygish. Concentration of Sr-90 in 0-5 cm layer of soil was 646E+3 Bq/kg.	Sr-90, Cs- 137	63,4E+3 Bq/m2 (Sr-90); 5,0E+3 Bq/m2 (Cs-137)	8,0E-6 Gy/day		Number of plants with leaves was 33,9%(2,0- 68,0%). In the control - 46,2% (34,8-56,8%).	MB	Pozolotina, 2001.

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin ation, Bq/m2	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
P33-8	Herbaceo us	Taraxacu m officinale s.l. Dandelio n	Area contaminated in 1957 as a result of the Kyshtym accident. Experimental plot located on the right shore of river Techa. Concentration of Sr-90 in 0-5 cm layer of soil was 4348E+3 Bq/kg. 1998.	Sr-90, Cs- 137	711,6E+ 3 Bq/m2 (Sr-90); 2506,6E +3 Bq/m2 (Cs-137)	1,0E-4 Gy/day		Numbers of plants with leaves were 36,1%(13,6- 44,4%). In the control - 46,2%(34,8-56,8%)).	MB	Pozolotina, 2001.
P34-1	Herbaceo us	Vicia cracca L. Wild vetch	Area with high level natural radioactivity. Komi region. Vegetative period was 100 days.	U-238, Ra- 226, Po-210		(4,8- 6,0)E-4 Gy/day	(0,05-0,07) Sv - for earth- based part of plants; (0,5-0,7)Sv - for roots.	In irradiated population of Vicia cracca L. numbers of sterile seed-buds was lower (0,70-0,77 then those in the control (0,99- 1,06).	MB	Popova, Taskaev,1977.
P34-2	Herbaceo us	Vicia cracca L. Wild vetch	Area with high level natural radioactivity. Komi region. Vegetative period was 100 days.	U-238, Ra- 226, Po-210		(4,8-6,0)E- 4 Gy/day	(0,05-0,07) Sv - for earth- based part of plants; (0,5-0,7)Sv - for roots.	Embryonic lethality in irradiated population of Vicia cracca L. was lower then that in the control: 49,6±5,8% and 62,2±1,9% respectively.	CG	Popova, Taskaev,1977.
Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate, Cu/d	Dose, Gy	Effect	Effect	Reference
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NN of	organism	name			01 surface	Gy/u			code	
record					soil					
iccolu					contamin					
					ation					
					Ba/m ²					
P35-1	Herbaceo	Vicia	Area with high	U-238 Ra-	Dq/III2	(3.6-60)E-	30-70 Gv	Acute irradiation in doses	STIM	Popova
100 1	115	cracca L	level natural	226. Po-210		5 Gv/day	20 / 0 0	30-70 Gy visibly		Taskaev, 1980.
		Wild	radioactivity. Komi			e ey, aay		stimulated germination of		1 401140 (,1) 001
		vetch	region. Seeds of					seeds from chronically		
			Vicia cracca L.					irraddiated population of		
			were additionally					Vicia cracca L., and from		
			exposed to probing					the control population.		
			acute gamma-					Number of germinated		
			radiation in doses					seeds was 91% (the control		
			30-150 Gy.					- 86%).		
P35-2	Herbaceo	Vicia	Area with high	U-238, Ra-		(3,6-60)E-	90 Gy and	Acute irradiation in doses	MB	Popova,
	us	cracca L.	level natural	226, Po-210		5 Gy/day	more	90 Gy and higher		Taskaev,1980.
		Wild	radioactivity. Komi					oppressed germination of		
		vetch	region. Seeds of					seeds both from		
			Vicia cracca L.					chronically irradiated		
			were additionally					population of Vicia cracca		
			exposed to probing					L., and from the control		
			acute gamma-					population.		
			radiation in doses							
			30-150 Gy.							
P35-3	Herbaceo	Vicia	Area with high	U-238, Ra-		(3,6-60)E-	90 Gy and	Radioresistance of seeds	MB	Popova,
	us	cracca L.	level natural	226, Po-210		5 Gy/day	more	from chronically irradiated		Taskaev,1980;
		Wild	radioactivity. Komi					population of Vicia cracca		Popova et.al.,
		vetch	region. Seeds of					L. was higher then in the		1985;
			Vicia cracca L.					control (27,5±2,5% and		Strelchuk,1975;
			were additionally					19,6±2,4% - in the		Strelchuk et.al.,
			exposed to probing					control).		1973.
			acute gamma-							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			radiation in doses							
			30-150 Gy.							
P35-4	Herbaceo	Vicia	Area with high	U-238, Ra-		6,0E-4		Towards the end of the	MB	Popova,
	us	cracca L.	level natural	226, Po-210		Gy/day		first vegetative period		Taskaev,1980;
		Wild	radioactivity. Komi					survival of Vicia cracca L.		Preobrazhenskaya
		vetch	region. Field study.					was 45,0±5,7% from the		,1971; Turbin
								maximum number of		et.al., 1977.
								sprouted plants		
								$(83,0\pm8,1\%)$ - in the		
								control).	~~	-
P36-1	Herbaceo	Vicia	Area with high	U-238, Ra-		6,0E-4		Number of variable	CG	Popova,
	us	cracca L.	level natural	226, Po-210		Gy/day		mitosis in chronicle		Shershunova, 1981
		Wild	radioactivity. Komi					irradiated plants was		; Popova et.al.,
		vetch	region.					68,2% (in the control -		1984a; Popova
								57,6%).	~~	et.al.,1984b.
P36-2	Herbaceo	Vicia	Area with high	U-238, Ra-		6,0E-4		Total number of anaphase	CG	Popova,
	us	cracca L.	level natural	226, Po-210		Gy/day		with aberrations in plants		Shershunova, 1981
		Wild	radioactivity. Komi					from experimental plot		; Popova et.al.,
		vetch	region.					was 1,9% (in the control -		1984a; Popova
								1,11%).	~~	et.al.,1984b.
P36-3	Herbaceo	Vicia	Area with high	U-238, Ra-		6,0E-4		Frequency of chlorophyll	CG	Popova,
	us	cracca L.	level natural	226, Po-210		Gy/day		mutations in chronicle		Shershunova,1981
		Wild	radioactivity. Komi					irradiated population was		; Popova et.al.,
		vetch	region.					lower then in the control		1984a; Popova
								(0,43% and 2,73% - in the		et.al.,1984b.
								control).	~~	
P37-1	Herbaceo	Vicia	Area with high	U-238, Ra-		(3,6-60)E-	70 Gy	Numbers of chromosomal	CG	Popova,
	us	cracca L.	level natural	226, Po-210		5 Gy/day		aberrations in population		Shershunova, 1987

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
record					soil					
record					contamin					
					ation,					
					Bq/m2					
		Wild	radioactivity. Komi					from contaminated area		; Popova et.al.,
		vetch	region. Field study.					were 10% (8% - in the		1986; Popova
			cracca I were					contror).		Popova
			additionally							et.al.,1985b.
			exposed to probing							
			gamma-radiation in							
			dose 70 Gy.						~~	-
P37-2	Herbaceo	Vicia	Area with high	U-238, Ra-		(3,6-60)E-	110 Gy	Numbers of chromosomal	CG	Popova, Sharshunova 1087
	us	Wild	radioactivity Komi	220, 10-210		5 Gy/day		from contaminated area		· Popova et al
		vetch	region. Field study.					was higher then that in the		1986; Popova
			Seeds of Vicia					control - 35% (20% - in		et.al.,1985a;
			cracca L. were					the control).		Popova
			additionally							et.al.,1985b.
			exposed to probing							
			dose 110 Gy							
P38-1	Herbaceo	Phleum	Area contaminated	Cs-137, Sr-		(2,4 -		In 1986, in the first	STIM	Popova et.al.,
	us	pratense	as a result of the	90, hot		1900)E-5		posterity of Phleum		1991.
		L.	Chernobyl accident.	particles		Gy/day		pratense L., Setaria viridis		
		Timothy-	1986-1988. The					L. Beauv, and		
		grass,	laboratory					Echinochloa crusgalli		
		Setaria viridis	experiment.					L. Deauv grown from		
		L Reauv						reproduction the survival		
		Echinoch						was 100%.		
		loa								

Identif ication NN of record	Type of organism	Latin name	Impact	Nuclide	Density of surface soil contamin	Dose rate, Gy/d	Dose, Gy	Effect	Effect code	Reference
					ation, Bq/m2					
		crusgalli L.Beauv								
P38-2	Herbaceo us	Phleum pratense L. Timothy- grass, Setaria viridis L.Beauv, Echinoch loa crusgalli L.Beauv	Area contaminated as a result of the Chernobyl accident. 1986-1988. The laboratory experiment.	Cs-137, Sr- 90, hot particles		(0,5- 6700)E-5 Gy/day		In 1987, in posterity of Phleum pratense L., Setaria viridis L.Beauv and Echinochloa crusgalli L.Beauv of second post- accident reproduction, no signs of oppression in plants grown from seeds obtained from higher contaminated plots were observed.	NE	Popova et.al., 1991.
P38-3	Herbaceo us	Phleum pratense L. Timothy- grass.	Area contaminated as a result of the Chernobyl accident. 1986-1988. The laboratory experiment.	Cs-137, Sr- 90, hot particles		(0,5 - 360)E-5 - Gy/day		In 1988, connection between radiation loading and changeability of morphometrical indicators was not revealed.	NE	Popova et.al., 1991.
P39-1	Herbaceo us	Phleum pratense L. Timothy- grass.	Area contaminated as a result of the Chernobyl accident. 1986-1988. Seeds of Phleum pratense L. were additionally exposed to probing acute gamma-	Cs-137, Sr- 90, hot particles		(0,5- 480)E-5 Gy/day	100-500 Gy	Delay in growth processes was observed.	MB	Frolova et.al., 1991; Preobrazhenskaya , 1971.

Identif	Type of organism	Latin	Impact	Nuclide	Density	Dose rate, Gv/d	Dose, Gy	Effect	Effect	Reference
NN of	organishi	nume			surface	Gy/u			couc	
record					soil					
					contamin					
					ation,					
					Bq/m2					
			radiation in							
			different doses.							
P39-2	Herbaceo	Phleum	Area contaminated	Cs-137, Sr-		(0,5-	5-10 Gy	Signs of growth depression	MB	Frolova et.al.,
	us	pratense	as a result of the	90, hot		480)E-5		were observed.		1991;
		L.	Chernobyl accident.	particles		Gy/day				Preobrazhenskaya
		Timothy-	1986-1988. Seeds							, 1971.
		grass.	of Phleum pratense							
			L. were additionally							
			exposed to probing							
			acute gamma-							
			radiation in							
D20.2	TT. A	וות	different doses.	Q. 127 Q.		(0.5	20.0		CTIM	F _1, 1,, (1)
P39-3	Herbaceo	Phleum	Area contaminated	Cs-137, Sr-		(0,5-	20 Gy	Stimulation of growth	STIM	Frolova et.al.,
	us	pratense	as a result of the	90, not		480)E-5		processes was observed.		1991; Drachrozhonstrovo
		L. Timothy	1086 1088 Soods	particles		Gy/day				1071
		Timoiny-	of Phloum protonso							, 1971.
		gruss.	I were additionally							
			exposed to probing							
			acute gamma.							
			radiation in							
			different doses.							
P39-4	Herbaceo	Phleum	Area contaminated	Cs-137, Sr-		(0,5-	50 and	Delay in growth of	MB	Frolova et.al.,
	us	pratense	as a result of the	90, hot		480)E-5	more Gy	embryonic rootlet and		1991;
		Ĺ.	Chernobyl accident.	particles		Gy/day	, in the second s	shoot was observed.		Preobrazhenskaya
		Timothy-	1986-1988. Seeds	-						, 1971.
		grass.	of Phleum pratense							
		-	L. were additionally							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	_		of	Gy/d			code	
NN of	_				surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			exposed to probing							
			acute gamma-							
			radiation in							
			different doses.							
P39-5	Herbaceo	Setaria	Area contaminated	Cs-137, Sr-		(2,4 -7,2	5-80 Gy	Stimulation of growth	STIM	Frolova et.al.,
	us	viridis	as a result of the	90, hot)E-4		processes was observed.		1991;
		L.Beauv	Chernobyl accident. 1986-1988. Seeds	particles		Gy/day (in 1988)				Preobrazhenskaya
			of Phleum pratense							, -, -, -,
			L. were additionally							
			exposed to probing							
			acute gamma-							
			radiation in							
			different doses.							
P39-6	Herbaceo	Setaria	Area contaminated	Cs-137, Sr-		(2,4 -	5-80 Gy	Signs of growth depression	MB	Frolova et.al.,
	us	viridis	as a result of the	90, hot		7,2)E-3	-	were observed.		1991;
		L.Beauv	Chernobyl accident.	particles		Gy/day (in				Preobrazhenskaya
			1986-1988. Seeds			1988)				, 1971.
			of Phleum pratense							
			L. were additionally							
			exposed to probing							
			acute gamma-							
			radiation in							
			different doses.							
P40-1	Trees	Pinus	Acute gamma-				10-30 Gy	Numbers of irradiated pine	ECO	Spirin et.al., 1985;
		sylvestris	irradiation of pine-					trees infested by	L	Karaban'
		L. Scotch	birch forest (trees					xylophagous insects were		et.al.,1977; Prister
		pine	of 30-years old).					10-18% (in the control -		et.al., 1977;

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			Activity of Cs-137					5%).		Karaban' et.al.,
			in the source was							1978.
			1,2E+15 Bq.							
			Destruction of							
			irradiated forest by							
			xylophagous insects							
			was studied.							
P40-2	Trees	Pinus	Acute gamma-				30-100 Gy	Numbers of irradiated pine	ECO	Spirin et.al., 1985;
		sylvestris	irradiation of pine-					trees infested by	L	Karaban'
		L. Scotch	birch forest (trees					xylophagous insects were		et.al.,1977; Prister
		pine	of 30-years old).					60-78% (in the control -		et.al., 1977;
			Activity of Cs-137					5%).		Karaban' et.al.,
			in the source was							1978.
			1,2E+15 Bq.							
			Destruction of							
			irradiated forest by							
			xylophagous insects							
			was studied.							
P40-3	Trees	Pinus	Acute gamma-				100-230	Numbers of irradiated pine	ECO	Spirin et.al., 1985;
		sylvestris	irradiation of pine-				Gy	trees infested by	L	Karaban'
		L. Scotch	birch forest (trees					xylophagous insects were		et.al.,1977; Prister
		pine	of 30-years old).					100% (in the control -		et.al., 1977;
			Activity of Cs-137					5%).		Karaban' et.al.,
			in the source was							1978.
			1,2E+15 Bq.							
			Destruction of							
			irradiated forest by							
			xylophagous insects							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d	-		code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			was studied.							
P41-1	Trees	Pinus	Acute gamma-				1-12 Gy	In the first vegetative	MB	Tikhomirov,
		sylvestris	irradiation of pine-				-	season the mass of pine		Fedotov, 1982.
		L. Scotch	birch forest.					pollen was 47-28% of the		
		pine	Activity of point					control ((1,0±0,1)E-2 g -in		
		[^]	source of Cs-137					the experimental plot and		
			was 1,0E+15 Bq.					$(2,1\pm0,2)$ E-2 g - in the		
			Ages of trees were					control).		
			24-26 years. Total							
			number of							
			irradiated trees was							
			2000 on each plot.							
			Observations were							
			carried out during							
			6 years after the							
			exposure.							
P41-2	Trees	Pinus	Acute gamma-				22 Gy	In the first vegetative	MT	Tikhomirov,
		sylvestris	irradiation of pine-					season the mass of pine		Fedotov, 1982.
		L. Scotch	birch forest.					pollen was 5% of the		
		pine	Activity of point					control ((0,1±0,1)E-2 g -in		
		<u>^</u>	source of Cs-137					the experimental plot and		
			was 1,0E+15 Bq.					$(2,1\pm+0,2)$ E-2 g - in the		
			Ages of trees were					control).		
			24-26 years. Total							
			number of							
			irradiated trees was							
			2000 on each plot.							
			Observations were							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of					surface					
record					soil					
					contamin					
					ation,					
					Bq/m2					
			carried out during							
			6 years after the							
D41.2	Ŧ	D.	exposure.				22.0	T (1 C'C)		TD'11
P41-3	Trees	Pinus	Acute gamma-				22 Gy	In the fifth vegetative	MB	Tikhomirov,
		sylvestris	irradiation of pine-					period the mass of pine		Fedotov, 1982.
		L. Scotch	Activity of point					pollen was 25% of the		
		pine	Activity of point					control $((0,4\pm0,1)E-2$ g -III the experimental plot and		
			source of C_{S} -157					(1.0 ± 0.2) E 2 g in the		
			$\Delta ges of trees were$					$(1,9\pm0,2)$ E-2 g - III the		
			24-26 years Total					control).		
			number of							
			irradiated trees was							
			2000 on each plot.							
			Observations were							
			carried out during							
			6 years after the							
			exposure.							
P41-4	Trees	Pinus	Acute gamma-				20-26 Gy	Most of trees died.	MT	Tikhomirov,
		sylvestris	irradiation of pine-							Fedotov, 1982.
		L. Scotch	birch forest.							
		pine	Activity of point							
			source of Cs-137							
			was 1,0E+15 Bq.							
			Ages of trees were							
			24-26 years. Total							
			number of							
			irradiated trees was							

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name			of	Gy/d			code	
NN of	-				surface	-				
record					soil					
					contamin					
					ation,					
					Bq/m2					
			2000 on each plot.							
			Observations were							
			carried out during							
			6 years after the							
			exposure.							
P41-5	Trees	Pinus	Acute gamma-				12 Gy	In the first years after the	CG	Tikhomirov,
		sylvestris	irradiation of pine-					irradiation (autumn		Fedotov, 1982.
		L. Scotch	birch forest.					irradiation) frequency of		
		pine	Activity of point					chromosomal aberrations		
			source of Cs-137					was 4,8±0,6% (in the		
			was 1,0E+15 Bq.					control - $0,9\pm0,5\%$).		
			Ages of trees were							
			24-26 years. Total							
			number of							
			irradiated trees was							
			2000 on each plot.							
			Observations were							
			carried out during							
			6 years after the							
			exposure.							
P41-6	Trees	Pinus	Acute gamma-				5 Gy	In the first years after the	CG	Tikhomirov,
		sylvestris	irradiation of pine-					irradiation (spring		Fedotov, 1982.
		L. Scotch	birch forest.					irradiation) frequency of		
		pine	Activity of point					chromosomal aberrations		
			source of Cs-137					was 15,9±0,8% (in the		
			was 1,0E+15 Bq.					control - $1,9\pm0,5\%$).		
			Ages of trees were							
			24-26 years. Total						1	

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
ication	organism	name	-		of	Gy/d			code	
NN of	-				surface	-				
record					soil					
					contamin					
					ation,					
					Bq/m2					
			number of							
			irradiated trees was							
			2000 on each plot.							
			Observations were							
			carried out during							
			6 years after the							
			exposure.							
P42-1	Trees	Pinus	Area contaminated		7,4E+6	0,2 Gy/day	19 Gy	Major part of terminal and	MB	Kryshev, 1997.
		sylvestris	in 1957 as a result		Bq/m2	(Sr-90) the	during the	lateral buds did not begin		
		L. Scotch	of the Kyshtym			initial	"acute"	to grow. Remaining buds		
		pine	accident. "Acute"			absorbed	period	developed into shortened		
		*	period. Autumn of			dose rate	1	clusters of shoots.		
			1957 - Winter of					Subsequently, the crowns		
			1957-1958. By the					of pine trees turned yellow		
			autumn of 1959, the					and dried up.		
			area of ruined pine					I.		
			trees was about 100							
			km2.							
P42-2	Trees	Pinus	Area contaminated		(1,5-	0,07	6,8 Gy	Partial damage of pine	MB	Kryshev, 1997.
		sylvestris	in 1957 as a result		1,8)E+6	Gy/day	during the	crown was observed, such		
		L. Scotch	of the Kyshtym		Bq/m2	(Sr-90) the	"acute"	as drying-up and falling of		
		pine	accident. "Acute"		_	initial	period	the needles, primarily in		
			period. Spring,			absorbed		the lower part of the		
			1958. The area of			dose rate		crown, and retarded		
			damaged pine trees					growth of shoots and		
			was about 200 km2.					wood.		
P42-3	Trees	Betula	Area contaminated		50E+6	1,3 Gy/day	88 Gy	Lethal effects in birch trees	MT	Kryshev, 1997;
		verrucos	in 1957 as a result		Bq/m2	(Sr-90) the	during the	were observed (falling of		Karaban' et.al.,

Identif	Type of	Latin	Impact	Nuclide	Density	Dose rate,	Dose, Gy	Effect	Effect	Reference
NN of	organism	name			of surface	Gy/d			code	
record					soil					
					contamin					
					ation, Bq/m2					
		a Ehrh.	of the Kyshtym			initial	"acute"	leaves, damage in crown		1979.
		Birch	accident. "Acute"			absorbed	period	etc.)		
			period. Autumn of			dose rate				
			1957 - Winter of 1957- 1958.							
P42-4	Trees	Betula	Area contaminated		150E+6	3,75	more 200	Total destruction of birch	MT	Kryshev, 1997;
		verrucos	in 1957 as a result		Bq/m2	Gy/day	Gy during	trees was observed.		Karaban' et.al.,
		a Ehrh.	of the Kyshtym			(Sr-90) the	the "acute"			1979.
		Birch	accident. "Acute"			initial	period			
			period. Autumn of			absorbed				
			1957 - Winter of			dose rate				
			1957- 1958.							