Table S5 Geochronological data for Permo-Triassic igneous rocks in the Faku-Yanji Area.

No.	Sample	Sample location	Rock type	Method	Age(Ma)	References
			Early Permian(293-273Ma)			
1	JK11–1	Beishantun	Meta-dacite	LA–ICP-MS	293 ± 2	Cao et al. 2012 [63]
2	BTZ1	N 42°34′40″E 123°13′01″	Andesite	SHRIMP	287 ± 2	This study
3	JK11–4	Beishantun	Rhyolite	LA–ICP-MS	286 ± 2	Cao et al. 2012[63]
4	YZ02–12–3	N 42°28′46″E 128°56′12″	Tonalite	LA–ICP-MS	285 ± 9	Zhang et al. 2004[41]
5	R20	Yanbian	Gabbro	SHRIMP	284.5 ± 2.5	Guo et al. 2016[65]
6	FK51	N 42°30′13″E 123°25′53″	Granodiorite	SHRIMP	284 ± 3	Zhang et al. 2005[39]
7	D2344TW1	N 42°33′06″,E 123°00′20″	Monzogranite	SHRIMP	283 ± 2	Shi et al. 2020[26]
8	YH8–1	Hunchun	Gabbro	LA–ICP-MS	282 ± 2	Cao et al. 2011[64]
9	16YT1–7	N 43°30′27″E 125°03′54″	Andesite	LA–ICP-MS	280 ± 1	Zhou et al. 2018[66]
10	13YT10–1	N 43°30′27″E 125°03′54″	Basaltic andesite	LA–ICP-MS	279 ± 1	Zhou et al. 2018[66]
11	JH4–1	Changshanxiang	Rhyolite	LA–ICP-MS	279 ± 3	Cao et al. 2012[63]
12	YB03–253	N 43°34′49″E 129°54′06″	Tonalite	LA–ICP-MS	277 ± 3	Wu et al. 2011[10]
13	PM504-2-1	N 42°10′03″E 122°58′05″	syenogranite	SHRIMP	276 ± 4	Shi et al. 2020[26]
14	16FK024	N 43°33′46″E 123°18′22″	Rhyolite	LA–ICP-MS	275.2 ± 1.9	Jing et al. 2020[67]
15	YH15–1	Guanmenjuzi	Basaltic andesite	LA–ICP-MS	275 ± 7	Cao et al. 2012[63]
16	16FK011	N 42°31′48.1″E 123°16′02.8″	Dacite	LA–ICP-MS	274.2 ± 2.1	Jing et al. 2020[67]
17	17FK002	N 43°31′29″E 123°15′23″	Rhyolite	LA–ICP-MS	274.7 ± 1.7	Jing et al. 2020[67]
18	06HCH–55	N 42°58′08″E 130°55′25″	Gabbro	LA–ICP-MS	273 ± 2	Guo et al. 2016[65]
			Middle-Late Permian(270-252Ma)			
19	LK12–1	N 46°21′07″E 124°45′50″	Garnet monzonite	LA–ICP-MS	270 ± 1	Cao et al. 2013[36]
20	16FK016	N 42°32′26″E 123°15′42″	Andesite	LA–ICP-MS	267.3 ± 0.9	Jing et al. 2020[67]
21	DXLC-TW1	N 42°35′33″E 123°17′41″	Granite	LA–ICP-MS	267 ± 6	Shi et al. 2020[26]

No.	Sample	Sample location	Rock type	Method	Age(Ma)	References
22	DR40	N 42°29′38″E 123°15′00″	Dacite	SHRIMP	267 ± 3	Liu et al. 2016[74]
23	16FK001	N 42°29′36.8″E 123°16′16.1″	Andesite	LA–ICP-MS	266.9 ± 3.5	Jing et al. 2020[67]
24	RZ39	N 42°32′12″E 124°28′50″	Gabbro–diorite	LA–ICP-MS	266 ± 2	Liu et al. 2019[28]
25	YB03–188	N 43°30′29″E 129°24′29″	Monzogranite	LA–ICP-MS	266 ± 3	Wu et al. 2011[10]
26	FK53	N 42°29′49″E 123°15′45″	Granodiorite	SHRIMP	265 ± 4	Zhang et al. 2005[39]
27	D6219TW1	N 42°29′41″E 123°10′45″	Granodiorite	SHRIMP	265 ± 1	Shi et al. 2020[26]
28	FW00–121	N 42°58′11″E 125°51′48″	Quartz syenite	SHRIMP	264 ± 5	Wu et al. 2011[10]
29	QJM-TW2	N 42°32′1″E 123°18′12″	Granodiorite	LA-ICP-MS	263 ± 4	Shi et al. 2020[26]
30	09HC–26	N 43°40′11″E 129°55′30″	Diorite	LA-ICP-MS	263 ± 3	Guo et al. 2016[65]
31	SMZG–1	N 43°05′24″E 127°52′42″	Granodiorite	LA-ICP-MS	263 ± 1	Liu et al. 2010[81]
32	JK17–1	N 43°11′23″E 126°26′45″	Amphibole gabbro	LA-ICP-MS	263 ± 1	Zhang et al. 2014[25]
33	11LK24–1	N 43°02′32″E 124°29′33″	Syenogranite	LA-ICP-MS	262 ± 2	Cao et al. 2013[36]
34	SMZM–1	N 43°05′24″E 127°52′42″	Gabbro	LA-ICP-MS	262 ± 1	Liu et al. 2010[81]
35	XNC–57	N 43°10′E 130°58′	Granodiorite	LA–ICP-MS	261 ± 5	Ma et al. 2019[75]
36	MG–143	N 42°16′10″E 124°46′52″	Monzogranite	SHRIMP	261 ± 20	Wu et al. 2011[10]
37	FK04–19	N 42°22′E 123°29′	Monzodiorite	SHRIMP	261 ± 2	Zhang et al. 2010[38]
38	YB03-77	N 44°08′49″E 130°44′52″	Syenogranite	LA-ICP-MS	261 ± 4	Wu et al. 2011[10]
39	D1694TW1	N 42°29′51″E 123°14′49″	Granodiorite	SHRIMP	261 ± 1	Shi et al. 2020[26]
40	CK91	N 42°37′37″E 124°25′53″	Migmatized diorite	LA–ICP-MS	260.8 ± 3.8	Gu et al., 2018[72]
41	XNC–43	N 43°11′E 130°56′	Diorite	LA–ICP-MS	260 ± 6	Ma et al. 2019[75]
42	11LK15–1	N 42°43′47″E 124°13′06″	Gabbro	LA–ICP-MS	260 ± 5	Cao et al. 2013[36]
43	DY124–2	N 43°05′57″E 125°50′52″	Alkali feldspar granite	LA–ICP-MS	260 ± 3	Wu et al. 2011[10]
44	RZ38	N 42°33′16″E 124°27′15″	Monzodiorite	LA–ICP-MS	260 ± 2	Liu et al. 2019[28]
45	FW00–45	N 42°54′19″E 128°23′19″	Quartz diorite	LA–ICP-MS	260 ± 2	Wu et al. 2011[10]
46	12JL1–1	N 43°23′56″E 126°01′10″	Syenogranite	LA–ICP-MS	260 ± 1	Cao et al. 2013[36]

No.	*Sample*	*Sample location*	*Rock type*	*Method*	*Age(Ma)*	*References*
47	12JL1–1	N 43°23′09″E 126°01′17″	Biotite monzogranite	LA–ICP-MS	260 ± 1	Wang et al. 2015[71]
48	CK70	N 42°32′43″E 124°28′57″	Deformed granodiorite	LA–ICP-MS	259.1 ± 3.1	Gu et al., 2018[72]
49	XNC–77	N 43°03′E 130°57′	Tonalite	LA–ICP-MS	259 ± 7	Ma et al. 2019[75]
50	LK36–1	N 42°52′12″E 125°44′41″	Biotite syenogranite	LA–ICP-MS	259 ± 2	Cao et al. 2013[36]
51	DY126–2	N 42°54′26″E 125°50′28″	Syenogranite	LA–ICP-MS	259 ± 3	Wu et al. 2011[10]
52	LK37–1	N 46°21′07″E 131°56′44″	Olivine gabbro	SIMS	258 ± 2	Cao et al. 2013[36]
53	HJT-TW1	N 42°38′42″E 123°34′40″	Granite	LA-ICP-MS	258 ± 3	Shi et al. 2020[26]
54	N–8	N 42°39′24″E 129°06′27″	Quartz diorite	LA–ICP-MS	258 ± 0.9	Guan et al. 2016[78]
55	CK09	N 42°16′27″E 123°30′39″	Deformed granite	LA–ICP-MS	257.5 ± 4.0	Gu et al., 2018[72]
56	XNC–12	N 43°14′E 130°57′	Dioritic enclave	LA–ICP-MS	257 ± 4	Ma et al., 2019[75]
57	LK25–9	N 43°26′37″E 124°54′02″	Monzogabbro	SIMS	257 ± 2	Cao et al. 2013[36]
58	XNC–98	N 43°04′E 130°59′	Gabbroic enclave	LA–ICP-MS	257 ± 6	Ma et al., 2019[75]
59	FX06–59	northwestern Liaoning	Mafic rocks	LA–ICP-MS	257 ± 4	Zhang et al. 2012[15]
60	09HC–18	N 43°01′11″E 130°58′25″	Gabbro	LA–ICP-MS	257 ± 2	Guo et al. 2016[65]
61	YB03–238	N 43°39′43″E 130°08′52″	Diorite	LA–ICP-MS	257 ± 5	Wu et al. 2011[10]
62	CK18	N 42°30′11″E 124°08′38″	Weakly deformed granite	LA–ICP-MS	256.6 ± 2.8	Gu et al., 2018[72]
63	DST1	N 43°30′32″E 125°07′37″	Syenogranite	LA–ICP-MS	256.5 ± 3.3	Song et al., 2018[73]
64	14SP12–1	N 43°32′39″E 125°04′29″	Monzogranite	LA–ICP-MS	256 ± 2	Zhou et al., 2018[66]
65	FX06–21	N 42°15′42″E 121°47′32″	Monzogranite	LA–ICP-MS	256 ± 4	Zhang et al. 2012[15]
66	11JJH4–1	N 43°59′76″E 127°20′84″	Gabbro-diorite	LA–ICP-MS	256 ± 2	Wang et al. 2013[70]
67	SD7	N 43°36′37″E 125°13′22″	Andesite	LA–ICP-MS	255.5 ± 3	Song et al. 2018[73]
68	DYS2	N 43°34′33″E 125°06′05″	Rhyodacite	LA–ICP-MS	255.4 ± 4.2	Song et al., 2018[73]
69	YH7–1	Hunchun	Diorite	LA–ICP-MS	255 ± 3	Cao et al. 2011[64]
70	LK24–1	N 42°55′23″E 124°34′18″	Deformed granodiorite	LA–ICP-MS	255 ± 2	Cao et al. 2013[36]

No.	Sample	Sample location	Rock type	Method	Age(Ma)	References
71	XQ1	N 43°34′49″E 125°14′58″	Rhyolite	LA–ICP-MS	254.7 ± 2.6	Song et al. 2018[73]
72	DYS1	N 43°34′33″E 125°06′05″	Rhyodacite	LA–ICP-MS	254.3 ± 2.5	Song et al., 2018[73]
73	MG–119	N 42°17′48″E 124°45′34″	Monzogranite	SHRIMP	254 ± 8	Wu et al. 2011[10]
74	XDM1	N 43°36′32″E 125°15′00″	Andesite	LA–ICP-MS	254 ± 3.6	Song et al. 2018[73]
75	FX06–18	northwestern Liaoning	Mafic rock	LA–ICP-MS	254 ± 3	Zhang et al. 2012[15]
76	09HCH–12	N 43°01′09″E 130°19′25″	Gabbro	LA–ICP-MS	254 ± 3	Guo et al. 2016[65]
77	QC05-1	N 42°32′40″E 124°21′36″	Andesite	LA–ICP-MS	253.3 ± 3.7	This study
78	XDC1	N 43°37′10″E 125°16′15″	Basaltic lava	LA–ICP-MS	253 ± 4.5	Song et al. 2018[73]
79	FW00–104	N 43°01′30″E 129°28′24″	Alkali feldspar granite	LA–ICP-MS	253 ± 2	Wu et al. 2011[10]
80	FW02–191	N 43°06′43″E 128°00′53″	Alkali feldspar granite	LA–ICP-MS	253 ± 2	Wu et al. 2011[10]
81	FW02–194	N 43°26′46″E 128°27′16″	Quartz diorite	LA–ICP-MS	253 ± 2	Wu et al. 2011[10]
82	B4135–2	Yongxin	Granite	LA–ICP-MS	252.8 ± 0.7	Shi et al., 2013[76]
83	CK17	N 42°31′41″E 124°08′59″	Deformed granite	LA–ICP-MS	252.3 ± 3.9	Chen et al. 2006[68]
84	JH3S–1	N 43°00′55″E 127°09′45″	Dacite	SHRIMP	252 ± 5	Li et al. 2007[69]
85	FX06–52	N 42°17′36″E 121°38′38″	Mafic rock	LA–ICP-MS	252 ± 2	Zhang et al. 2012[15]
86	13JH1–1	N 43°26′42″E 125°59′53″	Quartz monzonite	LA–ICP-MS	252 ± 1	Wang et al. 2015[71]
87	13JH3–1	N 43°59′42″E 127°20′48″	Hornblende gabbro	LA–ICP-MS	252 ± 1	Wang et al. 2015[71]
88	JK13–1	N 42°58′59″E 127°41′31″	Mylonitized monzogranite	LA–ICP-MS	252 ± 1	Wang et al. 2015[71]
89	DY143–2	N 43°02′31″E 125°06′22″	Monzogranite	LA–ICP-MS	252 ± 2	Wu et al. 2011[10]
90	CK30	N 42°10′56″E 123°34′05″	Weakly deformed granite	LA–ICP-MS	251.5 ± 4.1	Gu et al., 2018[72]
91	B4117–1	N 42°39′37″E 129°19′48″	Amphibole gabbro	LA–ICP-MS	251.1 ± 1.0	Zhang et al. 2014[25]
			Late Permian-Middle Triassic(251-240Ma)			
92	RZ08	N 42°25′10″E 124°40′40″	Monzogranite	LA–ICP-MS	251 ± 1	Liu et al. 2019[28]

No.	Sample	Sample location	Rock type	Method	Age(Ma)	References
93	DY123–4	N 43°06′40″E 125°57′29″	Alkali feldspar granite	LA–ICP-MS	251 ± 2	Wu et al. 2011[10]
94	YZ02–49	N 42°39′39″E 129°30′00″	Quartz diorite	LA–ICP-MS	251 ± 2	Zhang et al. 2004[41]
95	CK66	N 42°29′54″E 124°28′23″	Migmatized granodiorite	LA–ICP-MS	250.5 ± 2.9	Gu et al., 2018[72]
96	KY13–12–4	N 42°34′25″E 124°17′31″	Basaltic andesite	LA–ICP-MS	250 ± 4	Yuan et al. 2016[79]
97	YH2–1	Tumen	Basalt	LA–ICP-MS	250 ± 5	Cao et al. 2012[63]
98		N 42°25′48″E 124°41′46″	Rhyolite	SHRIMP	250 ± 5	Chen et al. 2006[68]
99	DGTW03	N 42°34′21″E 123°11′36″	Granitic mylonite	SHRIMP	250 ± 3	Shi et al. 2020[26]
100	14YB27-1	N 42°45′34.4″E 130°18′29.8″	Tonalite	LA–ICP-MS	249 ± 6	Yang et al. 2017[80]
101	HL–1	N 42°35′20″E 129°10′08″	Granite	LA–ICP-MS	249 ± 1.1	Shi et al. 2020[26]
102	13YB3–2	N 42°46′13″E 128°52′20″	Quartz monzonite	LA–ICP-MS	249 ± 1	Wang et al. 2015[71]
103	LK04–2	N 42°49′21″E 124°25′25″	Biotite monzonite	LA–ICP-MS	249 ± 1	Cao et al. 2013[36]
104	KY12–33–4	N 42°34′57″E 124°15′24″	Andesite	LA–ICP-MS	249	Yuan et al. 2016[79]
105	FK04–24	N 42°23′E 123°27′	Granite	LA–ICP-MS	249 ± 2	Zhang et al., 2010[38]
106	YZ02–2	N 42°52′15″E 128°30′32″	Monzogranite	LA–ICP-MS	249 ± 4	Zhang et al., 2004[41]
107	FK06–39	N 42°21′E 123°27′	Quartz monzonite	LA–ICP-MS	248 ± 2	Zhang et al., 2010[38]
108	9923—1	Dayushan	Granite	TIMS	248 ± 4	Sun et al. 2004[35]
109	14YB32	N 42°43′18.8″E 130°15′01.3″	Monzogranite	LA–ICP-MS	248 ± 5	Yang et al. 2017[80]
110	YZ02–27–2	N 42°03′10″E 128°49′32″	Monzogranite	LA–ICP-MS	248 ± 2	Zhang et al., 2004[41]
111	BJGC-TW1	N 42°34′5″E 123°36′20″	Granite	LA–ICP-MS	248 ± 2	Shi et al. 2020[26]
112	12LY2–1	N 43°02′42″E 125°24′13″	Biotite monzonite	LA–ICP-MS	247 ± 1	Cao et al. 2011[64]
113	FW00–34	N 43°08′45″E 127°53′47″	Diorite	SHRIMP	247 ± 1	Wu et al. 2011[10]
114	FW00–110	N 43°07′33″E 128°51′02″	Monzogranite	TIMS	247 ± 1	Wu et al. 2011[10]
115	YZ02-40	N 42°11′05″E 129°09′22″	Granodiorite	LA-ICP-MS	246 ± 3	Wu et al. 2011[10]
116	YZ02-22-2	N 42°12′14″E 128°49′21″	Monzogranite	LA-ICP-MS	245 ± 6	Zhang et al. 2004[41]

No.	Sample	Sample location	Rock type	Method	Age(Ma)	References
117	YZ02-25-2	N 42°10′57″E 128°44′58″	Monzogranite	LA-ICP-MS	245 ± 3	Zhang et al. 2004[41]
118	13JH28-1	N 42°45′59.2″E 128°57′31.1″	Monzogranite	LA-ICP-MS	245 ± 1	Wang et al. 2015[71]
119	D6008TW1	N 42°9′02″E 123°13′59″	Monzogranite	SHRIMP	245 ± 2	Shi et al. 2020[26]
120	QC04	N 42°32′43″E 124°22′05″	Dacite	LA-ICP-MS	244.3 ± 1.3	This study
121	b5157-1	N 42°37′26″E 129°19′49″	Monzogranite	LA-ICP-MS	243 ± 1	Guan et al. 2016[78]
122	MG-28	N 42°22′19″E 124°55′44″	Granodiorite	SHRIMP	243 ± 5	Wu et al. 2011[10]
123	MG-103	N 42°25′11″E 124°40′46″	Granodiorite	SHRIMP	243 ± 5	Wu et al. 2011[10]
124	MG-64	N 42°32′52″E 125°11′14″	Monzogranite	SHRIMP	242 ± 7	Wu et al. 2011[10]
125	FK04-5	N 42°29′46″E 123°29′32″	Gabbro	SHRIMP	241 ± 6	Zhang et al. 2009[40]
126	D0832-6	N 43°15′27″E 130°59′51″	High-Mg Diorite	LA-ICP-MS	241 ± 1	Fu et al. 2010[77]
127	PM603-10-1	N 42°18′06″E 123°13′58″	Granodiorite	SHRIMP	241 ± 2	Shi et al. 2020[26]
128	FW00-122	N 43°18′00″E 128°56′48″	Monzogranite	LA-ICP-MS	240 ± 2	Wu et al. 2011[10]
129	D0849-1	N 43°12′52″E 130°53′17″	High-Mg Diorite	LA-ICP-MS	240 ± 1	Fu et al. 2010[77]