

Appendix 1. The list of materials examined and vouchers of 60 populations belonging to 16 species of *Gagea* from Xinjiang, China.

Species	Locality	Coordinate	Altitude	Collection Date	Voucher
<i>Gagea alberti</i> (1)	Urumqi City, Xinjiang,	45.844092°N,	927 m	29 April 2020	J.Qiu
	China	84.775051°E			T-003 (XJA)
<i>G. alberti</i> (2)	Shihezi City, Xinjiang,	44.188091°N,	517 m	12 April 2022	J.Qiu & J.L.Li
	China	86.088827°E			L-034 (XJA)
<i>G. alberti</i> (3)	Urumqi City, Xinjiang,	43.857741°N,	795 m	16 April 2022	J.Qiu & J.L.Li
	China	87.544662°E			L-039 (XJA)
<i>G. alberti</i> (4)	Huocheng County,	44.004373°N,	599 m	21 April 2022	J.Qiu & J.L.Li
	Xinjiang, China	80.936525°E			L-054 (XJA)
<i>G. alberti</i> (5)	Yining City, Xinjiang,	43.724521°N,	1033 m	22 April 2022	J.Qiu & J.L.Li
	China	82.070256°E			L-062 (XJA)
<i>G. altaica</i> (1)	Fuyun County,	46.368831°N,	777 m	15 April 2021	J.Qiu & M.S.Lin
	Xinjiang, China	88.926181°E			L-006 (XJA)
<i>G. altaica</i> (2)	Fuyun County,	46.645528°N,	793 m	16 April 2021	J.Qiu & M.S.Lin
	Xinjiang, China	88.593935°E			L-007 (XJA)
<i>G. altaica</i> (3)	Fuyun County,	46.830949°N,	703 m	16 April 2021	J.Qiu & M.S.Lin
	Xinjiang, China	88.791038°E			L-009 (XJA)
<i>G. angelae</i>	Gongliu County,	43.110484°N,	1660 m	4 May 2021	J.C.Chi
	Xinjiang, China	82.751261°E			Chijc4473 (XJA)
<i>G. bulbifera</i> (1)	Shawan City, Xinjiang,	45.328851°N,	561 m	7 April 2021	J.Qiu & M.S.Lin
	China	88.455975°E			L-002 (XJA)
<i>G. bulbifera</i> (2)	Fuyun County,	46.841351°N,	1028 m	16 April 2021	J.Qiu & M.S.Lin
	Xinjiang, China	89.405816°E			L-008 (XJA)
<i>G. bulbifera</i> (3)	Urumqi City, Xinjiang,	43.830091°N,	996 m	18 April 2021	J.Qiu & M.S.Lin
	China	87.780818°E			L-013 (XJA)
<i>G. bulbifera</i> (4)	Shihezi City, Xinjiang,	44.194476°N,	664 m	12 April 2022	J.Qiu & J.L.Li
	China	86.079483°E			L-033 (XJA)
<i>G. bulbifera</i> (5)	Huocheng County,	44.004373°N,	599 m	21 April 2022	J.Qiu & J.L.Li
	Xinjiang, China	80.936525°E			L-055 (XJA)
<i>G. bulbifera</i> (6)	Yining City, Xinjiang,	43.817749°N,	880 m	22 April 2022	J.Qiu & J.L.Li
	China	81.902141°E			L-058 (XJA)
<i>G. bulbifera</i> (7)	Shawan City, Xinjiang,	44.235896°N,	903 m	20 April 2022	J.Qiu & J.L.Li
	China	85.821398°E			L-053 (XJA)

<i>G. divaricata</i> (1)	Fuhai County, Xinjiang, China	45.053634°N, 88.398225°E	712 m	17 April 2021	J.Qiu & M.S.Lin L-010 (XJA)
<i>G. divaricata</i> (2)	Fukang City, Xinjiang, China	44.739223°N, 88.270266°E	616 m	17 April 2021	J.Qiu & M.S.Lin L-011 (XJA)
<i>G. divaricata</i> (3)	Huocheng County, Xinjiang, China	44.018193°N, 80.775512°E	607 m	21 April 2022	J.Qiu & J.L.Li L-056 (XJA)
<i>G. fedtschenkoana</i> (1)	Nilka County, Xinjiang, China	43.652369°N, 84.362144°E	2278 m	2 June 2020	J.Qiu NLK-003 (XJA)
<i>G. fedtschenkoana</i> (2)	Bole City, Xinjiang, China	44.632994°N, 81.329544°E	2091 m	3 June 2020	J.Qiu SH-001 (XJA)
<i>G. fedtschenkoana</i> (3)	Qinghe County, Xinjiang, China	46.746946°N, 90.873269°E	2761 m	6 June 2021	J.Qiu & M.S.Lin L-018 (XJA)
<i>G. fedtschenkoana</i> (4)	Burqin County, Xinjiang, China	48.504169°N, 87.138269°E	1441 m	9 June 2021	J.Qiu & M.S.Lin L-022 (XJA)
<i>G. fedtschenkoana</i> (5)	Hutubi County County, Xinjiang, China	43.880653°N, 86.480528°E	1151 m	20 April 2022	J.Qiu & J.L.Li L-045 (XJA)
<i>G. fedtschenkoana</i> (6)	Manas County, Xinjiang, China	43.865031°N, 86.252183°E	1526 m	20 April 2022	J.Qiu & J.L.Li
<i>G. filiformis</i> (1)	Burqin County, Xinjiang, China	48.286741°N, 87.093257°E	1352 m	15 April 2020	J.Qiu BEJ-004 (XJA)
<i>G. filiformis</i> (2)	Urumqi City, Xinjiang, China	43.786772°N, 87.565508°E	1075 m	3 April 2021	J.Qiu & M.S.Lin L-004 (XJA)
<i>G. filiformis</i> (3)	Yuming County, Xinjiang, China	45.842106°N, 82.525295°E	1676 m	28 April 2021	J.Qiu Yu-002 (XJA)
<i>G. filiformis</i> (4)	Burqin County, Xinjiang, China	48.430501°N, 87.210654°E	1987 m	9 June 2021	J.Qiu & M.S.Lin L-025 (XJA)
<i>G. filiformis</i> (5)	Manas County, Xinjiang, China	43.865031°N, 86.252183°E	1526 m	20 April 2022	J.L.Li L-049 (XJA)
<i>G. fragifera</i> (1)	Qinghe County, Xinjiang, China	46.781335°N, 90.887534°E	2662 m	6 June 2021	J.Qiu & M.S.Lin L-017 (XJA)
<i>G. fragifera</i> (2)	Fuhai County, Xinjiang, China	48.059008°N, 88.920102°E	2401 m	7 April 2021	J.Qiu & M.S.Lin L-019 (XJA)
<i>G. fragifera</i> (3)	Burqin County, Xinjiang, China	48.429559°N, 87.207309°E	1988 m	9 June 2021	J.Qiu & M.S.Lin L-021 (XJA)

<i>G. granulosa</i> (1)	Xinyuan County, Xinjiang, China	43.248167°N, 84.011416°E	1882 m	4 June 2020	J.Qiu XY-002 (XJA)
<i>G. granulosa</i> (2)	Burqin County, Xinjiang, China	48.429694°N, 87.207108°E	1984 m	9 June 2021	J.Qiu & M.S.Lin L-023 (XJA)
<i>G. granulosa</i> (3)	Yuming County, Xinjiang, China	46.191895°N, 82.936688°E	709 m	28 April 2021	J.Qiu Yu-004 (XJA)
<i>G. jaeschkei</i> (1)	Tekes County, Xinjiang, China	43.411647°N, 81.040648°E	2538 m	9 June 2020	J.Qiu TKS-003 (XJA)
<i>G. jaeschkei</i> (2)	Qapqal County, Xinjiang, China	42.993913°N, 82.213955°E	2929 m	17 July 2021	J.Qiu & M.S.Lin L-30 (XJA)
<i>G. jaeschkei</i> (3)	Urumqi City, Xinjiang, China	43.119812°N, 86.855626°E	3492 m	6 June 2022	M.S.Lin & J.L.Li L-069 (XJA)
<i>G. jaeschkei</i> (4)	Bole City, Xinjiang, China	44.519168°N, 81.249635°E	2095 m	24 June 2022	J.L.Li L-070 (XJA)
<i>G. jensii</i>	Urumqi City, Xinjiang, China	43.783443°N, 87.544818°E	1002 m	8 April 2021	J.Qiu & M.S.Lin L-005 (XJA)
<i>G. nigra</i> (1)	Urumqi City, Xinjiang, China	43.783141°N, 87.544363°E	995 m	2 April 2021	J.Qiu & M.S.Lin L-003 (XJA)
<i>G. nigra</i> (2)	Urumqi City, Xinjiang, China	43.813774°N, 88.994927°E	1837 m	18 April 2021	J.Qiu & M.S.Lin L-012 (XJA)
<i>G. nigra</i> (3)	Urumqi City, Xinjiang, China	43.924234°N, 87.817345°E	916 m	5 April 2021	J.Qiu & M.S.Lin L-026 (XJA)
<i>G. nigra</i> (4)	Xinyuan County, Xinjiang, China	43.778801°N, 83.456579°E	1400 m	9 April 2021	X.J.Shi L-027 (XJA)
<i>G. nigra</i> (5)	Burqin County, Xinjiang, China	48.430593°N, 87.210654°E	1988 m	9 June 2021	J.Qiu & M.S.Lin L-024 (XJA)
<i>G. nigra</i> (6)	Yuming County, Xinjiang, China	45.842106°N, 82.525295°E	1676 m	28 April 2021	J.Qiu & M.S.Lin Yu-001 (XJA)
<i>G. nigra</i> (7)	Yuming County, Xinjiang, China	45.976943°N, 82.886943°E	1908 m	28 April 2021	J.Qiu & M.S.Lin Yu-008 (XJA)
<i>G. nigra</i> (8)	Urumqi City, Xinjiang, China	43.706494°N, 87.639277°E	1012 m	10 April 2022	J.Qiu & J.L.Li L-031 (XJA)
<i>G. nigra</i> (9)	Shihezi City, Xinjiang, China	44.188091°N, 86.088827°E	664 m	12 April 2022	J.Qiu & J.L.Li L-036 (XJA)
<i>G. nigra</i> (10)	Fukang City, Xinjiang,	43.897795°N,	2357 m	13 April 2022	J.Qiu & J.L.Li

	China	88.118855°E				L-037 (XJA)
<i>G. neopopovii</i>	Huocheng County, Xinjiang, China	44.480000°N, 81.170000°E	2100 m	19 May 2021	X.J. Ge	Gexj-21019 (XJA)
<i>G. kunawurensis</i> (1)	Urumqi City, Xinjiang, China	43.785813°N, 87.545323°E	997 m	29 April 2021	J.Qiu & M.S.Lin	L-015 (XJA)
<i>G. kunawurensis</i> (2)	Shihezi City, Xinjiang, China	44.194476°N, 86.079483°E	664 m	12 April 2022	J.Qiu & J.L.Li	L-035 (XJA)
<i>G. kunawurensis</i> (3)	Shawan City, Xinjiang, China	44.235896°N, 85.821398°E	903 m	20 April 2022	J.Qiu & J.L.Li	L-052 (XJA)
<i>G. kunawurensis</i> (4)	Yining City, Xinjiang, China	43.817749°N, 81.902141°E	880 m	22 April 2022	J.Qiu & J.L.Li	L-057 (XJA)
<i>G. stepposa</i> (1)	Urumqi County, Xinjiang, China	43.516102°N, 87.447984°E	1559 m	10 April 2022	J.Qiu & J.L.Li	L-032 (XJA)
<i>G. stepposa</i> (2)	Hutubi County, Xinjiang, China	43.821214°N, 86.429608°E	1160 m	20 April 2022	J.Qiu & J.L.Li	L-040 (XJA)
<i>G. tenera</i> (1)	Yining City, Xinjiang, China	43.625463°N, 82.128763°E	600 m	29 April 2020	J.C.Chi	Chijc1907 (XJA)
<i>G. tenera</i> (2)	Nilka County, Xinjiang, China	43.724538°N, 82.070252°E	1033 m	22 April 2022	J.Qiu & J.L.Li	L-041 (XJA)

Appendix 2. A one-way ANOVA results of species with more than two populations.

Species	<i>Gagea alberti</i>	<i>G. altaica</i>	<i>G. bulbifera</i>	<i>G. divaricata</i>	<i>G. fedtschenkoana</i>	<i>G. filiformis</i>	<i>G. fragifera</i>
df	4	2	6	2	5	4	2
F	0.756	0.953	0.409	1.333	1.908	1.991	1.052
<i>p</i>	0.555	0.389	0.872	0.269	0.095	0.099	0.354

Appendix 2. (Continued).

Species	<i>Gagea granulosa</i>	<i>G. jaeschkei</i>	<i>G. nigra</i>	<i>G. kunawurensis</i>	<i>G. stepposa</i>	<i>G. tenera</i>
df	2	3	9	3	1	1
F	1.236	2.154	0.986	0.623	2.732	0.131
<i>p</i>	0.296	0.097	0.452	0.602	0.104	0.718

