**Table S1 The geographical information of *A. tanguticus***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| No. | Location |  Longitude(°) | Latitude(°) | Altitude(m) |
| SC1 | Hongyuan, Sichuan | 102.59 | 33.18 | 3449 |
| SC2 | Rangtang, Sichuan | 100.87 | 32.29 | 3488 |
| SC3 | Seda, Sichuan | 100.36 | 32.25 | 3816 |
| SC4 | Luhuo, Sichuan | 99.98 | 31.64 | 3477 |
| SC5 | Ganzi, Sichuan | 99.03 | 31.58 | 3379 |
| SC6 | Dege, Sichuan | 99.44 | 31.80 | 3662 |
| SC7 | Baiyu, Sichuan | 98.95 | 30.97 | 3920 |
| SC8 | Shiqu, Sichuan | 98.34 | 32.99 | 3921 |
| GS9 | Xiahe, Gansu | 102.39 | 35.16 | 3254 |
| GS10 | Hezuo, Gansu | 102.98 | 35.02 | 3006 |
| GS11 | Maqu, Gansu | 101.88 | 34.00 | 3432 |
| GS12 | Luqu, Gansu | 102.48 | 34.65 | 3225 |
| QH13 | Jiuzhi, Qinghai | 101.53 | 33.54 | 3533 |
| QH14 | Maqin, Qinghai | 100.63 | 32.05 | 3618 |
| QH15 | Xiewu, Qinghai | 97.38 | 33.11 | 3883 |
| QH16 | Menyuan, Qinghai | 101.42 | 37.56 | 3106 |
| QH17 | Qilian, Qinghai | 99.45 | 38.07 | 3084 |
| QH18 | Huzhu, Qinghai | 102.13 | 37.00 | 3051 |
| QH19 | Guide, Qinghai | 101.54 | 36.29 | 3046 |
| QH20 | Guinan, Qinghai | 101.09 | 35.60 | 3504 |
| QH21 | Zeku, Qinghai | 100.73 | 35.12 | 3439 |
| QH22 | Maqin, Qinghai | 100.44 | 34.54 | 3742 |
| QH23 | Gande, Qinghai | 100.16 | 33.81 | 3922 |
| QH24 | Maduo, Qinghai | 100.73 | 32.94 | 3506 |
| QH25 | Dari, Qinghai | 100.52 | 33.20 | 3853 |
| QH26 | Jiegu, Qinghai | 96.78 | 33.09 | 4107 |
| QH27 | Batang, Qinghai | 96.98 | 32.86 | 3864 |
| QH28 | Laxiu, Qinghai | 96.61 | 32.69 | 3982 |
| QH29 | Nangqian, Qinghai | 96.39 | 32.52 | 3991 |
| QH30 | Zaduo, Qinghai | 95.38 | 32.85 | 3996 |
| QH31 | Zaduo, Qinghai | 95.56 | 32.87 | 4008 |
| QH32 | Chengduo, Qinghai | 97.16 | 33.35 | 3971 |
| QH33 | Henan, Qinghai | 101.47 | 34.68 | 3479 |
| QH34 | Zeku, Qinghai | 101.82 | 35.21 | 3463 |
| QH35 | Tongren, Qinghai | 102.29 | 35.44 | 3301 |
| QH36 | Xunhua, Qinghai | 102.24 | 35.70 | 3233 |
| QH37 | Xunhua, Qinghai | 102.80 | 35.50 | 2948 |
| QH38 | Hualong, Qinghai | 102.09 | 36.19 | 2737 |
| QH39 | Huzhu, Qinghai | 102.10 | 36.89 | 2769 |
| QH40 | Pingan, Qinghai | 102.09 | 36.38 | 2768 |
| QH41 | Tianzhu, Qinghai | 102.45 | 37.52 | 2963 |
| QH42 | Menyuan, Qinghai | 101.90 | 37.38 | 2900 |
| QH43 | Qilian, Qinghai | 99.55 | 38.42 | 3276 |
| QH44 | Nangqian, Qinghai | 96.61 | 32.14 | 3798 |
| QH45 | Leiwuqi, Qinghai | 96.51 | 31.35 | 4064 |
| XZ46 | Changdu, Tibet | 97.26 | 31.25 | 3820 |
| XZ47 | Chaya, Tibet | 97.52 | 30.74 | 4455 |
| XZ48 | Changdu, Tibet | 97.22 | 30.82 | 4383 |
| XZ49 | Basu, Tibet | 97.22 | 30.55 | 4320 |
| XZ50 | Linzhi, Tibet | 94.12 | 29.90 | 3096 |
| XZ51 | Gongbu, Tibet | 92.81 | 29.95 | 4021 |
| XZ52 | Gongbu, Tibet | 92.58 | 29.65 | 4176 |
| XZ53 | Shannan, Tibet | 92.02 | 28.93 | 4257 |
| XZ54 | Gongbu, Tibet | 92.45 | 29.87 | 3509 |
| XZ55 | Jiali, Tibet | 92.35 | 30.83 | 4573 |
| XZ56 | Liangzika, Tibet | 90.43 | 29.07 | 4464 |
| XZ57 | Jiangzi, Tibet | 90.07 | 28.96 | 4464 |
| XZ58 | Nanmulin, Tibet | 89.34 | 29.88 | 3995 |
| XZ59 | Nimu, Tibet | 89.91 | 29.42 | 3836 |
| XZ60 | Qushui, Tibet | 90.78 | 29.52 | 3692 |
| XZ61 | Dangxiong, Tibet | 90.73 | 30.17 | 3894 |
| XZ62 | Dangxiong, Tibet | 91.17 | 30.49 | 4210 |
| XZ63 | Biru, Tibet | 92.78 | 31.91 | 4155 |
| XZ64 | Suoxian, Tibet | 93.70 | 31.96 | 4238 |
| XZ65 | Baqing, Tibet | 94.04 | 32.09 | 4055 |
| XZ66 | Dingqing, Tibet | 94.99 | 31.71 | 3990 |
| XZ67 | Dingqing, Tibet | 95.69 | 31.70 | 4010 |
| XZ68 | Leiwuqi, Tibet | 96.62 | 31.39 | 3941 |
| XZ69 | Jiangdu, Tibet | 98.83 | 32.02 | 3596 |
| XZ70 | Jiangda, Tibet | 97.82 | 31.39 | 4007 |
| XZ71 | Jiangda, Tibet | 98.03 | 31.37 | 3935 |