**Supplementary material**

Table S1 *Brassica napus* accessions, breeding period, country of origin, ecotype and type **From Chen *et al*. (2014) Table 1**

| Entry no. | Name of accession | Breeding period | Country of origin | Ecotype | Type |  | Entry no. | Name of accession | Breeding period | Country of origin | Ecotype | Type |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | Shengliqinggeng | 1950–1970 | China | Semi-winter | ++ |  | 245 | P11 | 1971–1980 | Czech Republic | Winter | ++ |
| 2 | Shengli 52 | 1950–1970 | China | Semi-winter | ++ |  | 246 | SV.Niklas | 1971–1980 | Sweden | Spring | 0+ |
| 3 | Gongnong 1 | 1950–1970 | China | Semi-winter | ++ |  | 247 | SV.0321 | 1971–1980 | Sweden | Winter | ++ |
| 4 | No 23 Rape | 1950–1970 | China | Semi-winter | ++ |  | 248 | Omega | 1971–1980 | Sweden | Spring | 0+ |
| 5 | Huyou 2 | 1950–1970 | China | Semi-winter | ++ |  | 249 | WW 1307 | 1971–1980 | Sweden | Spring | ++ |
| 6 | Huyou 3 | 1950–1970 | China | Semi-winter | ++ |  | 250 | Olga | 1971–1980 | Sweden | Spring | 0+ |
| 7 | Shaoyeqing | 1950–1970 | China | Semi-winter | ++ |  | 251 | P9 | 1971–1980 | Sweden | Spring | ++ |
| 8 | Shangyou 1 | 1950–1970 | China | Semi-winter | ++ |  | 252 | P23 | 1971–1980 | Sweden | Spring | ++ |
| 9 | Jiuer Rape | 1950–1970 | China | Semi-winter | ++ |  | 253 | H23 | 1971–1980 | Sweden | Spring | ++ |
| 10 | Ningyou 1 | 1950–1970 | China | Semi-winter | ++ |  | 254 | H24 | 1971–1980 | Sweden | Winter | ++ |
| 11 | Ningyou 5 | 1950–1970 | China | Semi-winter | ++ |  | 255 | H53 | 1971–1980 | Sweden | Winter | ++ |
| 12 | Dahuaqiu | 1950–1970 | China | Semi-winter | ++ |  | 256 | H54 | 1971–1980 | Sweden | Winter | ++ |
| 13 | Zaofeng 1 | 1950–1970 | China | Semi-winter | ++ |  | 257 | H55 | 1971–1980 | Sweden | Spring | ++ |
| 14 | 363 | 1950–1970 | China | Semi-winter | ++ |  | 258 | WW.Hanna | 1971–1980 | Sweden | Spring | ++ |
| 15 | Ganyou 2 | 1950–1970 | China | Semi-winter | ++ |  | 259 | SV.Topas | 1981–1990 | Sweden | Spring | 00 |
| 16 | Ganyou 4 | 1950–1970 | China | Semi-winter | ++ |  | 260 | SV.Tyko | 1981–1990 | Sweden | Spring | ++ |
| 17 | Huayou 3 | 1950–1970 | China | Semi-winter | ++ |  | 261 | SV.Global | 1981–1990 | Sweden | Spring | 0+ |
| 18 | Huayou 8 | 1950–1970 | China | Semi-winter | ++ |  | 262 | SV.02312 | 1981–1990 | Sweden | Spring | ++ |
| 19 | Huayou 9 | 1950–1970 | China | Semi-winter | ++ |  | 263 | Westar ZN6-2836 | 1981–1990 | Canada | Spring | 00 |
| 20 | Huayou 12 | 1950–1970 | China | Semi-winter | ++ |  | 264 | Regent | 1971–1980 | Canada | Spring | 00 |
| 21 | Huayou 13 | 1950–1970 | China | Semi-winter | ++ |  | 265 | Tower | 1971–1980 | Canada | Spring | 00 |
| 22 | Chuanyou 2 | 1950–1970 | China | Semi-winter | ++ |  | 266 | Target | 1971–1980 | Sweden | Spring | ++ |
| 23 | Chuannongchangjiao | 1950–1970 | China | Semi-winter | ++ |  | 267 | Altex | 1971–1980 | Sweden | Spring | ++ |
| 24 | Aijiazao | 1950–1970 | China | Semi-winter | ++ |  | 268 | Andor | 1971–1980 | Sweden | Spring | ++ |
| 25 | Xinan 302 | 1950–1970 | China | Semi-winter | ++ |  | 269 | P3 | 1971–1980 | Sweden | Spring | ++ |
| 26 | Luzhou 5 | 1950–1970 | China | Semi-winter | ++ |  | 270 | P25 | 1971–1980 | Sweden | Spring | ++ |
| 27 | Yiyou 3 | 1950–1970 | China | Semi-winter | ++ |  | 271 | P26 | 1971–1980 | Sweden | Spring | ++ |
| 28 | Yunyou 7 | 1950–1970 | China | Semi-winter | ++ |  | 272 | Belinda | 1971–1980 | Germany | Winter | ++ |
| 29 | Yunyou 49 | 1950–1970 | China | Semi-winter | ++ |  | 273 | Bok.Wok 13 | 1971–1980 | USA | Spring | ++ |
| 30 | Qingyou 6 | 1950–1970 | China | Spring | ++ |  | 274 | Dac chosen | 1971–1980 | USA | Spring | ++ |
| 31 | Qingyou 8 | 1950–1970 | China | Spring | ++ |  | 275 | 77-33 | 1971–1980 | USA | Spring | ++ |
| 32 | Shengli Rape | 1950–1970 | Japan | Winter | ++ |  | 276 | 77-70 | 1971–1980 | USA | Spring | ++ |
| 33 | Chikuzen-Natane | 1950–1970 | Japan | Winter | ++ |  | 277 | 79-186 | 1971–1980 | USA | Spring | ++ |
| 34 | Norin 18 | 1950–1970 | Japan | Winter | ++ |  | 278 | 79-201 | 1971–1980 | USA | Spring | ++ |
| 35 | Norin 20 | 1950–1970 | Japan | Winter | ++ |  | 279 | Jie 45 | 1981–1990 | China | Semi-winter | ++ |
| 36 | Early Korean | 1950–1970 | Japan | Winter | ++ |  | 280 | Jie 65 | 1981–1990 | China | Semi-winter | ++ |
| 37 | Zephyr | 1950–1970 | Canada | Spring | ++ |  | 281 | 87 jian 2 | 1981–1990 | China | Semi-winter | ++ |
| 38 | Midas | 1950–1970 | Canada | Spring | 0+ |  | 282 | Zheyouyou 2 | 1981–1990 | China | Semi-winter | 0+ |
| 39 | Turret | 1950–1970 | Canada | Spring | ++ |  | 283 | 8705 | 1981–1990 | China | Semi-winter | ++ |
| 40 | Oro | 1950–1970 | Canada | Spring | 0+ |  | 284 | Xingxuan 2 | 1981–1990 | China | Semi-winter | ++ |
| 41 | Canadian Rapeseed 1 | 1950–1970 | Canada | Spring | ++ |  | 285 | D19-5 | 1981–1990 | China | Semi-winter | ++ |
| 42 | Canadian Rapeseed 2 | 1950–1970 | Canada | Spring | ++ |  | 286 | 912 | 1981–1990 | China | Semi-winter | ++ |
| 43 | European Rape | 1950–1970 | Italy | Winter | ++ |  | 287 | 1035 | 1981–1990 | China | Semi-winter | ++ |
| 44 | Italy Rape | 1950–1970 | Italy | Winter | ++ |  | 288 | White flower (2) | 1981–1990 | China | Semi-winter | ++ |
| 45 | USSR Rape | 1950–1970 | USSR | Winter | ++ |  | 289 | White flower (3) | 1981–1990 | China | Semi-winter | ++ |
| 46 | Poland Rape(2) | 1950–1970 | Poland | Winter | ++ |  | 290 | 638 | 1981–1990 | China | Winter | ++ |
| 47 | Mlochowski | 1950–1970 | Poland | Winter | ++ |  | 291 | Zaofeng 5 | 1981–1990 | China | Semi-winter | ++ |
| 48 | Giant | 1950–1970 | UK | Winter | ++ |  | 292 | Yuyou 2 | 1981–1990 | China | Semi-winter | 0+ |
| 49 | Giant-1 | 1950–1970 | UK | Winter | ++ |  | 293 | Qingtaipengyangyoucai | 1981–1990 | China | Semi-winter | ++ |
| 50 | UK Short Rape | 1950–1970 | UK | Winter | ++ |  | 294 | Zouma yangyoucai | 1981–1990 | China | Semi-winter | ++ |
| 51 | Major | 1950–1970 | France | Winter | ++ |  | 295 | Geleche yangyoucai | 1981–1990 | China | Semi-winter | ++ |
| 52 | Primor | 1971–1980 | France | Winter | 0+ |  | 296 | 85-1 | 1981–1990 | China | Semi-winter | ++ |
| 53 | 135 | 1971–1980 | China | Semi-winter | ++ |  | 297 | 88-4-43-1 | 1981–1990 | China | Semi-winter | ++ |
| 54 | Luojing Xuanxi | 1971–1980 | China | Semi-winter | ++ |  | 298 | Engyou 2 | 1981–1990 | China | Semi-winter | ++ |
| 55 | Caoyou 2 | 1971–1980 | China | Semi-winter | ++ |  | 299 | Zhongyoudijie 1 | 1981–1990 | China | Semi-winter | 0+ |
| 56 | 82-2524 | 1971–1980 | China | Semi-winter | ++ |  | 300 | Zhongshuang 1 | 1981–1990 | China | Semi-winter | 00 |
| 57 | Xinghuanghua | 1971–1980 | China | Semi-winter | ++ |  | 301 | 18-8 | 1981–1990 | China | Semi-winter | ++ |
| 58 | Youguangye | 1971–1980 | China | Semi-winter | ++ |  | 302 | 88-161 | 1981–1990 | China | Semi-winter | ++ |
| 59 | 78251 | 1971–1980 | China | Semi-winter | ++ |  | 303 | Penglai 1 | 1981–1990 | China | Semi-winter | ++ |
| 60 | Zheyouyou 1 | 1971–1980 | China | Semi-winter | ++ |  | 304 | 320 | 1981–1990 | China | Semi-winter | ++ |
| 61 | Yang 2008 | 1971–1980 | China | Semi-winter | ++ |  | 305 | III-227 | 1981–1990 | China | Semi-winter | 0+ |
| 62 | Yangyou 1 | 1971–1980 | China | Semi-winter | ++ |  | 306 | III-229 | 1981–1990 | China | Semi-winter | ++ |
| 63 | Sui 1-4 | 1971–1980 | China | Semi-winter | ++ |  | 307 | 88-2 | 1981–1990 | China | Semi-winter | 0+ |
| 64 | Violet Rape | 1971–1980 | China | Semi-winter | ++ |  | 308 | 86126-1-2 | 1981–1990 | China | Semi-winter | ++ |
| 65 | BF10 | 1971–1980 | China | Spring | ++ |  | 309 | 90-2 | 1981–1990 | China | Semi-winter | ++ |
| 66 | BF10(A) | 1971–1980 | China | Spring | ++ |  | 310 | 870921-4 | 1981–1990 | China | Semi-winter | 0+ |
| 67 | 3209 | 1971–1980 | China | Semi-winter | ++ |  | 311 | (1)63 | 1981–1990 | China | Semi-winter | 0+ |
| 68 | Guangde 741 | 1971–1980 | China | Semi-winter | ++ |  | 312 | 86-18-II-14 | 1981–1990 | China | Semi-winter | ++ |
| 69 | 698-141 | 1971–1980 | China | Semi-winter | ++ |  | 313 | Kaiyou 1 | 1981–1990 | China | Semi-winter | ++ |
| 70 | Yaojin Rape | 1950-1970 | Italy | Semi-winter | ++ |  | 314 | Youyan 1 | 1981–1990 | China | Semi-winter | ++ |
| 71 | Zaofeng 4 | 1971–1980 | China | Spring | ++ |  | 315 | Youyan 2 | 1981–1990 | China | Semi-winter | ++ |
| 72 | Ningqiangyuquanba | 1971–1980 | China | Semi-winter | ++ |  | 316 | 8143-2-8 | 1981–1990 | China | Semi-winter | ++ |
| 73 | 7902 | 1971–1980 | China | Winter | ++ |  | 317 | 862 | 1981–1990 | China | Semi-winter | ++ |
| 74 | Nanyang 41 | 1971–1980 | China | Winter | ++ |  | 318 | 87-9 | 1981–1990 | China | Semi-winter | ++ |
| 75 | Kai 07 | 1971–1980 | China | Winter | ++ |  | 319 | 90-2 | 1981–1990 | China | Semi-winter | ++ |
| 76 | Xinglong 1 | 1971–1980 | China | Winter | ++ |  | 320 | 83-258 | 1981–1990 | China | Spring | 0+ |
| 77 | 51 rape | 1971–1980 | China | Winter | ++ |  | 321 | Qiongguoqu | 1981–1990 | China | Spring | ++ |
| 78 | Zhengyou 1 | 1971–1980 | China | Winter | ++ |  | 322 | Qingyou 12 | 1981–1990 | China | Spring | ++ |
| 79 | Heyou 1 | 1971–1980 | China | Winter | ++ |  | 323 | 85-15-3-1 | 1981–1990 | China | Spring | 0+ |
| 80 | Ganyou 5 | 1971–1980 | China | Semi-winter | ++ |  | 324 | Xuanma 2 | 1981–1990 | China | Spring | 0+ |
| 81 | Zhongyou 821 | 1981–1990 | China | Semi-winter | ++ |  | 325 | 1.7 | 1981–1990 | Japan | Winter | ++ |
| 82 | Ligele 1 | 1971–1980 | China | Semi-winter | ++ |  | 326 | Japanese long pod | 1981–1990 | Japan | Winter | ++ |
| 83 | Huayou 16 | 1971–1980 | China | Semi-winter | ++ |  | 327 | Chikuzen | 1981–1990 | Japan | Winter | ++ |
| 84 | Huahuang 1 | 1971–1980 | China | Semi-winter | ++ |  | 328 | Pivot | 1981–1990 | Canada | Spring | ++ |
| 85 | Xiangyou 5 | 1971–1980 | China | Semi-winter | ++ |  | 329 | Annick | 1981–1990 | Korean | Winter | ++ |
| 86 | Erhua B | 1971–1980 | China | Semi-winter | ++ |  | 330 | Velox | 1981–1990 | Korean | Winter | ++ |
| 87 | 57A | 1971–1980 | China | Semi-winter | ++ |  | 331 | Shiralee | 1981–1990 | Australia | Spring | ++ |
| 88 | Yixuan 159 | 1971–1980 | China | Semi-winter | ++ |  | 332 | Yickadee | 1981–1990 | Australia | Spring | 0+ |
| 89 | 78007 | 1971–1980 | China | Semi-winter | ++ |  | 333 | Optima | 1981–1990 | Denmark | Spring | ++ |
| 90 | 6024-2 | 1971–1980 | China | Semi-winter | ++ |  | 334 | Wikki | 1981–1990 | Denmark | Spring | 00 |
| 91 | 6012-1 | 1971–1980 | China | Semi-winter | ++ |  | 335 | Viking | 1981–1990 | Denmark | Winter | ++ |
| 92 | 6024-1 | 1971–1980 | China | Semi-winter | ++ |  | 336 | Cobra | 1981–1990 | Germany | Winter | ++ |
| 93 | 78007 | 1971–1980 | China | Semi-winter | ++ |  | 337 | Parter | 1981–1990 | Germany | Winter | ++ |
| 94 | 3-99 | 1971–1980 | China | Semi-winter | ++ |  | 338 | 7300 | 1981–1990 | Germany | Winter | ++ |
| 95 | 4050-4149 | 1971–1980 | China | Semi-winter | ++ |  | 339 | 7306 | 1981–1990 | Germany | Winter | ++ |
| 96 | 77054-2 | 1971–1980 | China | Semi-winter | ++ |  | 340 | 28669 | 1981–1990 | Germany | Winter | ++ |
| 97 | 4350-4449 | 1971–1980 | China | Semi-winter | ++ |  | 341 | 50202 | 1981–1990 | Germany | Winter | ++ |
| 98 | 84-3 | 1971–1980 | China | Semi-winter | ++ |  | 342 | Falcon | 1981–1990 | Germany | Winter | ++ |
| 99 | 86-4 | 1971–1980 | China | Semi-winter | ++ |  | 343 | Koolzaand-2 | 1981–1990 | Netherlands | Winter | ++ |
| 100 | 3145-60 | 1971–1980 | China | Semi-winter | ++ |  | 344 | Sielecki | 1981–1990 | France | Spring | ++ |
| 101 | EH3143 | 1971–1980 | China | Semi-winter | ++ |  | 345 | Nevin | 1981–1990 | UK | Winter | ++ |
| 102 | 4092 | 1971–1980 | China | Semi-winter | ++ |  | 346 | Ew-2 | 1981–1990 | UK | Winter | ++ |
| 103 | 2W019 | 1971–1980 | China | Semi-winter | ++ |  | 347 | Samurai | 1981–1990 | France | Winter | 00 |
| 104 | 3W042 | 1971–1980 | China | Semi-winter | ++ |  | 348 | Roman-1 | 1981–1990 | Netherlands | Winter | ++ |
| 105 | Yueyang 84-8 | 1971–1980 | China | Semi-winter | ++ |  | 349 | Tornado | 1981–1990 | Sweden | Spring | ++ |
| 106 | Bingyou 1 | 1971–1980 | China | Semi-winter | ++ |  | 350 | Legend | 1981–1990 | Sweden | Spring | 0+ |
| 107 | 83008 | 1971–1980 | China | Semi-winter | ++ |  | 351 | Grant | 1981–1990 | Sweden | Spring | 0+ |
| 108 | 408-8 | 1971–1980 | China | Semi-winter | 0+ |  | 352 | Topas.No.6050 | 1981–1990 | Sweden | Spring | 00 |
| 109 | 84-57 | 1971–1980 | China | Semi-winter | ++ |  | 353 | Celebra | 1981–1990 | Canada | Spring | 0+ |
| 110 | 72-2 | 1971–1980 | China | Semi-winter | ++ |  | 354 | Arabella | 1981–1990 | Canada | Winter | ++ |
| 111 | 74-317 | 1971–1980 | China | Semi-winter | ++ |  | 355 | Triton | 1981–1990 | Canada | Spring | ++ |
| 112 | Jinyou 15 | 1971–1980 | China | Semi-winter | ++ |  | 356 | Profit | 1981–1990 | Canada | Spring | 00 |
| 113 | Piyou 23 | 1971–1980 | China | Semi-winter | ++ |  | 357 | SEL-W | 1981–1990 | Mexico | Spring | 0+ |
| 114 | 213 | 1971–1980 | China | Semi-winter | ++ |  | 358 | 317 | 1991–2000 | China | Semi-winter | 0+ |
| 115 | Yunyou 11 | 1971–1980 | China | Semi-winter | ++ |  | 359 | 6084 | 1991–2000 | China | Semi-winter | ++ |
| 116 | Yunyou 12 | 1971–1980 | China | Semi-winter | ++ |  | 360 | 93-2-2 | 1991–2000 | China | Semi-winter | ++ |
| 117 | Hongqiaoyou 1 | 1971–1980 | China | Semi-winter | ++ |  | 361 | GSB604 | 1991–2000 | China | Semi-winter | ++ |
| 118 | Fuyou 1 | 1971–1980 | China | Spring | 0+ |  | 362 | GSB611 | 1991–2000 | China | Semi-winter | ++ |
| 119 | Meijian | 1971–1980 | China | Spring | ++ |  | 363 | GSB612 | 1991–2000 | China | Semi-winter | 0+ |
| 120 | Fuyou 4 | 1971–1980 | China | Spring | 0+ |  | 364 | GSB615 | 1991–2000 | China | Semi-winter | ++ |
| 121 | Dong-Hae23 | 1971–1980 | Japan | Winter | ++ |  | 365 | GSB627 | 1991–2000 | China | Semi-winter | ++ |
| 122 | Kojo 35 | 1971–1980 | Japan | Winter | ++ |  | 366 | GSB630 | 1991–2000 | China | Semi-winter | ++ |
| 123 | Kojo 57 | 1971–1980 | Japan | Winter | ++ |  | 367 | GSB641 | 1991–2000 | China | Semi-winter | ++ |
| 124 | Norin 34 | 1971–1980 | Japan | Winter | ++ |  | 368 | 940171 | 1991–2000 | China | Semi-winter | 0+ |
| 125 | Ganpol | 1971–1980 | Japan | Winter | ++ |  | 369 | 941608 | 1991–2000 | China | Semi-winter | ++ |
| 126 | Well bell | 1971–1980 | Japan | Winter | ++ |  | 370 | 95-139 | 1991–2000 | China | Semi-winter | ++ |
| 127 | Mutsu | 1971–1980 | Japan | Winter | ++ |  | 371 | 950246 | 1991–2000 | China | Semi-winter | ++ |
| 128 | Aomori | 1971–1980 | Japan | Winter | ++ |  | 372 | 950229 | 1991–2000 | China | Semi-winter | ++ |
| 129 | Norin16 | 1971–1980 | Japan | Winter | ++ |  | 373 | 951061 | 1991–2000 | China | Semi-winter | ++ |
| 130 | Norin 25 | 1971–1980 | Japan | Winter | ++ |  | 374 | AB027 | 1991–2000 | China | Semi-winter | 0+ |
| 131 | Dong-Hae16 | 1971–1980 | Japan | Winter | ++ |  | 375 | 96762 | 1991–2000 | China | Winter | ++ |
| 132 | SemuDA 16/81 | 1971–1980 | Canada | Spring | ++ |  | 376 | 96786 | 1991–2000 | China | Winter | ++ |
| 133 | Golda | 1971–1980 | Germany | Spring | 00 |  | 377 | 961331 | 1991–2000 | China | Winter | ++ |
| 134 | NARC | 1971–1980 | Pakistan | Winter | ++ |  | 378 | Yellow seed 2 | 1991–2000 | China | Winter | ++ |
| 135 | Changran rape 2 | 1971–1980 | Korean | Winter | ++ |  | 379 | 96539 | 1991–2000 | China | Winter | ++ |
| 136 | Rongshan rape | 1971–1980 | Korean | Winter | ++ |  | 380 | Yellow seed 1 | 1991–2000 | China | Winter | 0+ |
| 137 | Superlati-velot 601 | 1971–1980 | New Zealand | Winter | ++ |  | 381 | 96780 | 1991–2000 | China | Winter | 0+ |
| 138 | Rangi | 1971–1980 | New Zealand | Winter | ++ |  | 382 | 961460 | 1991–2000 | China | Winter | ++ |
| 139 | AB448 | 1971–1980 | Australia | Spring | ++ |  | 383 | 96628 | 1991–2000 | China | Winter | ++ |
| 140 | RV3 | 1971–1980 | Australia | Spring | 00 |  | 384 | 97992 | 1991–2000 | China | Winter | ++ |
| 141 | Liraglu | 1971–1980 | Australia | Winter | ++ |  | 385 | Yellow seed 4 | 1991–2000 | China | Winter | 0+ |
| 142 | BLN240 | 1971–1980 | Australia | Spring | ++ |  | 386 | Yellow seed 5 | 1991–2000 | China | Winter | 0+ |
| 143 | BLN241 | 1971–1980 | Australia | Spring | ++ |  | 387 | Yellow seed 6 | 1991–2000 | China | Winter | ++ |
| 144 | BLN247 | 1971–1980 | Australia | Spring | 0+ |  | 388 | Yellow seed 7 | 1991–2000 | China | Winter | ++ |
| 145 | DH 9-2 | 1971–1980 | Australia | Spring | ++ |  | 389 | Yellow seed 8 | 1991–2000 | China | Winter | ++ |
| 146 | RV6 | 1971–1980 | Australia | Spring | ++ |  | 390 | Yellow seed 9 | 1991–2000 | China | Winter | ++ |
| 147 | RV7 | 1971–1980 | Australia | Spring | ++ |  | 391 | 4014 | 1991–2000 | China | Semi-winter | 0+ |
| 148 | Marnoo | 1971–1980 | Australia | Spring | ++ |  | 392 | Shuangyou 968 | 1991–2000 | China | Semi-winter | ++ |
| 149 | Ru6 | 1971–1980 | Australia | Spring | ++ |  | 393 | 97 xuan | 1991–2000 | China | Semi-winter | ++ |
| 150 | Wesreo | 1971–1980 | Australia | Spring | ++ |  | 394 | Chuanyou 96II45 | 1991–2000 | China | Semi-winter | ++ |
| 151 | Wesroona | 1971–1980 | Australia | Spring | 0+ |  | 395 | Chuanyou 960-91 | 1991–2000 | China | Semi-winter | ++ |
| 152 | 73N22-1 | 1971–1980 | Australia | Spring | ++ |  | 396 | I-Y-14 | 1991–2000 | China | Semi-winter | ++ |
| 153 | Wesbrook | 1971–1980 | Australia | Spring | 00 |  | 397 | Chuanyou 96-98 | 1991–2000 | China | Semi-winter | ++ |
| 154 | Wili | 1971–1980 | Denmark | Spring | ++ |  | 398 | Chuanyou 96II-19 | 1991–2000 | China | Semi-winter | ++ |
| 155 | Dandy | 1971–1980 | Denmark | Spring | ++ |  | 399 | E097076 | 1991–2000 | China | Semi-winter | ++ |
| 156 | Ujfertadi-1 | 1971–1980 | Hungary | Winter | ++ |  | 400 | Jianyang Rape | 1991–2000 | China | Semi-winter | ++ |
| 157 | Ujfertadi-2 | 1971–1980 | Hungary | Winter | ++ |  | 401 | Y018 | 1991–2000 | China | Semi-winter | ++ |
| 158 | SavariA | 1971–1980 | Hungary | Winter | ++ |  | 402 | HEA20 | 1991–2000 | China | Semi-winter | ++ |
| 159 | H19 | 1971–1980 | Hungary | Winter | ++ |  | 403 | 90214-1 | 1991–2000 | China | Semi-winter | ++ |
| 160 | Liradonna | 1971–1980 | Germany | Winter | 0+ |  | 404 | 93345 | 1991–2000 | China | Semi-winter | 0+ |
| 161 | NPZ 2/84 | 1971–1980 | Germany | Winter | 0+ |  | 405 | 93355 | 1991–2000 | China | Semi-winter | ++ |
| 162 | Lesira | 1971–1980 | Germany | Winter | 0+ |  | 406 | 90147-8 | 1991–2000 | China | Semi-winter | ++ |
| 163 | Expander | 1971–1980 | Germany | Winter | ++ |  | 407 | 90-5047 | 1991–2000 | China | Semi-winter | ++ |
| 164 | Erra | 1971–1980 | Germany | Winter | 0+ |  | 408 | Chuanyou 92-005 | 1991–2000 | China | Semi-winter | ++ |
| 165 | Quinta | 1971–1980 | Germany | Winter | 0+ |  | 409 | Chuanyou H-53 | 1991–2000 | China | Semi-winter | ++ |
| 166 | Ledos | 1971–1980 | Germany | Winter | ++ |  | 410 | Chuanyou 92-028 | 1991–2000 | China | Semi-winter | ++ |
| 167 | Ligora | 1971–1980 | Germany | Winter | ++ |  | 411 | Mianhui 1 | 1991–2000 | China | Semi-winter | ++ |
| 168 | Librador | 1971–1980 | Germany | Winter | 00 |  | 412 | Mianhui 3 | 1991–2000 | China | Semi-winter | 0+ |
| 169 | Erglu | 1971–1980 | Germany | Winter | 0+ |  | 413 | Mianza 94-13 | 1991–2000 | China | Semi-winter | ++ |
| 170 | Rucabo | 1971–1980 | Germany | Spring | ++ |  | 414 | Chuanyou 933059 | 1991–2000 | China | Semi-winter | ++ |
| 171 | DSV-SR50 | 1971–1980 | Germany | Winter | ++ |  | 415 | Chuanyou 92-054 | 1991–2000 | China | Semi-winter | ++ |
| 172 | Lilandor | 1971–1980 | Germany | Winter | 0+ |  | 416 | Heiyoucai | 1991–2000 | China | Semi-winter | ++ |
| 173 | Wiama | 1971–1980 | Germany | Winter | ++ |  | 417 | Chengkoushengli | 1991–2000 | China | Semi-winter | ++ |
| 174 | Doral | 1971–1980 | Germany | Winter | 0+ |  | 418 | Chuanyou 92-057 | 1991–2000 | China | Semi-winter | ++ |
| 175 | 77 N | 1971–1980 | Germany | Winter | ++ |  | 419 | 9918 | 1991–2000 | China | Spring | ++ |
| 176 | H4 | 1971–1980 | Germany | Winter | ++ |  | 420 | Kao-48 | 1991–2000 | China | Semi-winter | ++ |
| 177 | H7 | 1971–1980 | Germany | Winter | ++ |  | 421 | Zhongshuang 4 | 1991–2000 | China | Semi-winter | 0+ |
| 178 | H8 | 1971–1980 | Germany | Winter | ++ |  | 422 | Cresor-1 | 1991–2000 | France | Spring | 0+ |
| 179 | H10 | 1971–1980 | Germany | Winter | 0+ |  | 423 | Startigh | 1991–2000 | Sweden | Spring | 00 |
| 180 | H13 | 1971–1980 | Germany | Winter | ++ |  | 424 | Bounty | 1991–2000 | Sweden | Spring | 0+ |
| 181 | H15 | 1971–1980 | Germany | Winter | ++ |  | 425 | Garrison | 1991–2000 | Sweden | Spring | 0+ |
| 182 | H18 | 1971–1980 | Germany | Winter | ++ |  | 426 | 92-7-58 | 1991–2000 | China | Semi-winter | 0+ |
| 183 | H22 | 1971–1980 | Germany | Winter | ++ |  | 427 | HN-9464 | 1991–2000 | Korean | Semi-winter | ++ |
| 184 | H26 | 1971–1980 | Germany | Winter | ++ |  | 428 | Garrison-1 | 1991–2000 | Sweden | Spring | ++ |
| 185 | H29 | 1971–1980 | Germany | Winter | ++ |  | 429 | Coronet | 1991–2000 | Sweden | Spring | 0+ |
| 186 | H31 | 1971–1980 | Germany | Winter | ++ |  | 430 | Gulle | 1991–2000 | Sweden | Spring | ++ |
| 187 | H32 | 1971–1980 | Germany | Winter | ++ |  | 431 | Gulliver | 1991–2000 | Sweden | Winter | 0+ |
| 188 | Sollux | 1971–1980 | Germany | Winter | ++ |  | 432 | Pet horse | 1991–2000 | Sweden | Spring | ++ |
| 189 | P22 | 1971–1980 | Germany | Winter | ++ |  | 433 | Jupiter | 1991–2000 | Sweden | Spring | ++ |
| 190 | P27 | 1971–1980 | Germany | Winter | ++ |  | 434 | Casino | 1991–2000 | Sweden | Winter | 0+ |
| 191 | Hja 81839 | 1971–1980 | Finland | Spring | ++ |  | 435 | Puma-SV.8627102 | 1991–2000 | Sweden | Winter | 0+ |
| 192 | Hja 82414 | 1971–1980 | Finland | Spring | 0+ |  | 436 | Haya Natan | 1991–2000 | Japan | Winter | ++ |
| 193 | Hja 82470 | 1971–1980 | Finland | Spring | ++ |  | 437 | Esa Giulia Natan | 1991–2000 | Japan | Winter | ++ |
| 194 | Hja 82703 | 1971–1980 | Finland | Spring | 0+ |  | 438 | Tor Kiva Natan | 1991–2000 | Japan | Winter | ++ |
| 195 | Hja 82708 | 1971–1980 | Finland | Spring | 0+ |  | 439 | Abiku horse | 1991–2000 | Japan | Winter | ++ |
| 196 | Hja 82799 | 1971–1980 | Finland | Winter | ++ |  | 440 | Kincaid Natan | 1991–2000 | Japan | Winter | ++ |
| 197 | H43 | 1971–1980 | USSR | Winter | ++ |  | 441 | Mi Jo Kay Natan | 1991–2000 | Japan | Winter | ++ |
| 198 | H44 | 1971–1980 | USSR | Winter | ++ |  | 442 | Ivo Luo Natan | 1991–2000 | Japan | Winter | ++ |
| 199 | H45 | 1971–1980 | USSR | Winter | ++ |  | 443 | Westar | 1991–2000 | Canada | Spring | 00 |
| 200 | H46 | 1971–1980 | USSR | Winter | ++ |  | 444 | Gesunder | 1991–2000 | Germany | Winter | ++ |
| 201 | H47 | 1971–1980 | USSR | Winter | ++ |  | 445 | Diamant | 1991–2000 | Germany | Winter | ++ |
| 202 | H48 | 1971–1980 | USSR | Winter | ++ |  | 446 | MAR | 1991–2000 | Poland | Winter | ++ |
| 203 | H49 | 1971–1980 | USSR | Winter | ++ |  | 447 | 7304 | 1991–2000 | India | Winter | ++ |
| 204 | H51 | 1971–1980 | USSR | Spring | ++ |  | 448 | 34406 | 1991–2000 | India | Winter | ++ |
| 205 | Janpol | 1971–1980 | Poland | Winter | 0+ |  | 449 | Hanna | 1991–2000 | Sweden | Spring | 0+ |
| 206 | Garant | 1971–1980 | Poland | Winter | 0+ |  | 450 | Marnoo-2 | 1991–2000 | Australia | Spring | 0+ |
| 207 | Gorczanski | 1971–1980 | Poland | Winter | ++ |  | 451 | ReginaII | 1991–2000 | Sweden | Semi-winter | ++ |
| 208 | Start | 1971–1980 | Poland | Winter | 0+ |  | 452 | Star | 1991–2000 | Denmark | Spring | 00 |
| 209 | Tripol | 1971–1980 | Poland | Winter | 00 |  | 453 | HM42 | 2001–2010 | China | Semi-winter | 00 |
| 210 | Libra | 1971–1980 | Poland | Winter | ++ |  | 454 | Zheyou 17 | 2001–2010 | China | Semi-winter | 00 |
| 211 | P5 | 1971–1980 | Poland | Winter | ++ |  | 455 | P6036-1 | 2001–2010 | China | Semi-winter | 00 |
| 212 | P6 | 1971–1980 | Poland | Winter | ++ |  | 456 | P6036-2 | 2001–2010 | China | Semi-winter | 00 |
| 213 | P7 | 1971–1980 | Poland | Winter | ++ |  | 457 | 699 | 2001–2010 | China | Semi-winter | 00 |
| 214 | H38 | 1971–1980 | Poland | Winter | ++ |  | 458 | Zhongshuang 11 | 2001–2010 | China | Semi-winter | 00 |
| 215 | H39 | 1971–1980 | Poland | Winter | ++ |  | 459 | 56602 | 2001–2010 | China | Semi-winter | 00 |
| 216 | Bronowski | 1971–1980 | Poland | Spring | +0 |  | 460 | 99-1055 | 2001–2010 | China | Semi-winter | 00 |
| 217 | Mikado | 1971–1980 | UK | Winter | 0+ |  | 461 | Zhongshuang 9 | 2001–2010 | China | Semi-winter | 00 |
| 218 | 77-258 | 1971–1980 | UK | Winter | ++ |  | 462 | Zheyou 18 | 2001–2010 | China | Semi-winter | 00 |
| 219 | 77-257-5 | 1971–1980 | UK | Winter | ++ |  | 463 | You 88 | 2001–2010 | China | Semi-winter | 00 |
| 220 | Gonda | 1971–1980 | Germany | Winter | ++ |  | 464 | Huyou 17 | 2001–2010 | China | Semi-winter | 00 |
| 221 | Dutch Black Rape | 1971–1980 | Poland | Winter | ++ |  | 465 | Yangjian 8 | 2001–2010 | China | Semi-winter | 00 |
| 222 | P20 | 1971–1980 | UK | Winter | ++ |  | 466 | Zhongnongyou 136 | 2001–2010 | China | Semi-winter | 00 |
| 223 | H56 | 1971–1980 | UK | Winter | ++ |  | 467 | Huyou 18 | 2001–2010 | China | Semi-winter | 00 |
| 224 | Mochowski | 1971–1980 | France | Winter | ++ |  | 468 | Xiwang 106 | 2001–2010 | China | Semi-winter | 00 |
| 225 | Nachan | 1971–1980 | France | Winter | 0+ |  | 469 | Zheyou 5002 | 2001–2010 | China | Semi-winter | 00 |
| 226 | Rapora | 1971–1980 | Germany | Winter | ++ |  | 470 | Hongyou 3 | 2001–2010 | China | Semi-winter | 00 |
| 227 | Prota 3129 | 1971–1980 | France | Spring | ++ |  | 471 | 24729 | 2001–2010 | China | Semi-winter | 0+ |
| 228 | Remeo | 1971–1980 | France | Spring | ++ |  | 472 | Yang 6614 | 2001–2010 | China | Semi-winter | 00 |
| 229 | Sedo-10 | 1971–1980 | France | Spring | 0+ |  | 473 | Su 6106 | 2001–2010 | China | Semi-winter | 0+ |
| 230 | Topas-15 | 1971–1980 | France | Spring | 00 |  | 474 | Su J209 | 2001–2010 | China | Semi-winter | 0+ |
| 231 | Line | 1971–1980 | France | Spring | 00 |  | 475 | Zheyou 6001 | 2001–2010 | China | Semi-winter | 00 |
| 232 | Lingot | 1971–1980 | France | Spring | ++ |  | 476 | Shengguang 77 | 2001–2010 | China | Semi-winter | 00 |
| 233 | H25 | 1971–1980 | France | Winter | ++ |  | 477 | 68232 | 2001–2010 | China | Semi-winter | 00 |
| 234 | H62 | 1971–1980 | France | Winter | ++ |  | 478 | Huyou 19 | 2001–2010 | China | Semi-winter | 00 |
| 235 | Cresor | 1971–1980 | France | Spring | 0+ |  | 479 | Yangguang 2008 | 2001–2010 | China | Semi-winter | 00 |
| 236 | Aao | 1971–1980 | France | Spring | ++ |  | 480 | N5424 | 2001–2010 | China | Semi-winter | 00 |
| 237 | Tantar | 1971–1980 | France | Spring | ++ |  | 481 | Huyou 21 | 2001–2010 | China | Semi-winter | 00 |
| 238 | P17 | 1971–1980 | France | Spring | ++ |  | 482 | N6013 | 2001–2010 | China | Semi-winter | 00 |
| 239 | Wipot | 1971–1980 | Norway | Spring | ++ |  | 483 | Yan 6015 | 2001–2010 | China | Semi-winter | 00 |
| 240 | Koolzaad-2 | 1971–1980 | Netherlands | Winter | ++ |  | 484 | Yang J6771 | 2001–2010 | China | Semi-winter | 00 |
| 241 | Koolzaad-3 | 1971–1980 | Netherlands | Winter | ++ |  | 485 | G142 | 2001–2010 | China | Semi-winter | 0+ |
| 242 | Koolzaad-4 | 1971–1980 | Netherlands | Winter | ++ |  | 486 | KT0601 | 2001–2010 | China | Semi-winter | 00 |
| 243 | H40 | 1971–1980 | Czech Republic | Winter | ++ |  | 487 | Yangza 1 | 2001–2010 | China | Semi-winter | ++ |
| 244 | H41 | 1971–1980 | Czech Republic | Winter | ++ | 　 | 488 | 8M2280 | 2001–2010 | China | Semi-winter | ++ |

The designation of type given in brackets indicates high (+) or zero (0) erucic acid and high (+) or low (0) glucosinolate content, respectively

Table S2 Means, standard deviations and LSD comparison of 10 quality traits in accessions from different ecotype across two years

|  |  |  |  |
| --- | --- | --- | --- |
| Ecotype | N | % | Trait/Mean±SD  |
| OC | PC | GLC | PAL | STE | OLE | LNL | LIN | EIC | ERU |
| Winter OSR | 166 | 34.0% | 40.55±1.59 b B | 23.35±0.94 a A | 76.05±13.46 a A | 3.65±0.70 b B | 2.03±0.43 b B | 31.12±13.49 b B | 15.74±3.30 b B | 7.63±2.53 b B | 9.91±2.77 a A | 29.91±17.14 a A |
| Semi-winter OSR | 210 | 43.0% | 41.39±1.76 a A | 22.89±1.10 b B | 63.86±20.09 b B | 3.65±0.65 b B | 1.97±0.51 b B | 33.72±18.01 b B | 15.04±3.09 c B | 7.77±1.97 b B | 9.77±3.94 a A | 28.08±19.19 a A |
| Spring OSR | 112 | 23.0% | 40.84±1.41 b B | 23.04±0.97 b AB | 66.40±16.33 b B | 3.98±0.72 a A | 2.25±0.48 a A | 39.07±14.54 a A | 17.00±3.41 a A | 8.59±2.67 a A | 9.45±3.49 a A | 19.65±18.52 b B |

Oil content (%; OC), Protein content (%; PC), Total glucosinolate content (µmol/g; GLC), Palmitic acid content (%; PAL), Stearic acid content (%; STE), Oleic acid content (%; OLE), Linoleic acid content (%; LNL), Linolenic acid content (%; LIN), Eicosenoic acid content (%; EIC), Erucic acid content (%; ERU). The same as below.

Different lowercase letters mean significantly different at α=0.05 level, and different uppercase letters mean significantly different at α=0.01 level. The same as below

Table S3 Means, standard deviations and LSD comparison of 10 quality traits in accessions from different geographic origin across two years

|  |  |  |  |
| --- | --- | --- | --- |
| Origin | N | % | Trait/Mean±SD  |
| OC | PC | GLC | PAL | STE | OLE | LNL | LIN | EIC | ERU |
| China | 245 | 50.2% | 41.38±1.74 a A | 22.90±1.06 c C | 63.97±19.40 b B | 3.70±0.66 b B | 2.00±0.51 bc B | 34.61±17.71 ab A | 15.39±3.20 c B | 7.72±2.18 bc B | 9.59±3.86 b B | 26.97±19.20 bc B |
| Eroupe | 166 | 34.0% | 40.46±1.38 b B | 23.28±0.97 b B | 72.80±16.42 a A | 3.80±0.73 b B | 2.14±0.49 ab AB | 35.13±14.42 ab A | 16.36±3.47 b A | 7.98±2.56 bc B | 9.47±3.00 b B | 25.12±18.48 c BC |
| Japan | 26 | 5.3% | 40.84±1.82 ab AB | 23.13±0.90 bc BC | 78.14±9.77 a A | 3.27±0.37 c C | 1.83±0.27 c B | 22.04±7.89 c B | 13.58±1.63 d C | 7.91±1.45 bc B | 11.46±1.51 a A | 39.91±9.20 a A |
| America | 23 | 4.7% | 41.21±1.64 ab AB | 23.12±0.88 bc BC | 73.16±9.91 a A | 3.68±0.78 b B | 2.07±0.45 b B | 31.73±13.26 ab A | 15.48±3.64 c B | 8.29±2.85 b AB | 10.72±3.18 ab AB | 28.02±18.60 bc B |
| Australia | 20 | 4.1% | 40.86±1.57 ab AB | 22.89±1.05 c C | 68.10±16.15 ab AB | 4.23±0.70 a A | 2.32±0.41 a A | 40.92±12.68 a A | 18.10±2.99 a A | 9.86±2.67 a A | 10.28±4.29 ab AB | 14.29±17.01 d C |
| Other region | 8 | 1.6% | 39.31±0.96 c B | 24.50±0.57 a A | 79.61±7.46 a A | 3.21±0.20 c C | 1.89±0.21 bc B | 23.88±6.69 bc AB | 14.63±0.81 cd BC | 6.30±0.94 c B | 10.52±1.52 ab AB | 39.57±5.58 ab AB |

Table S4 The variance components and heritability for 10 quality traits

|  |  |  |
| --- | --- | --- |
| Trait | Variance | Heritability |
| Genotype/ Year | Genotype | Year | Repeat /Year | Residual |
| OC | 0.34 | 2.36 | 0.00 | 4.58 | 1.47 | 0.815 |
| PC | 0.26 | 0.75 | 0.00 | 0.18 | 1.19 | 0.636 |
| GLC | 8.27 | 569.19 | 8.27 | 4.67 | 27.19 | 0.981 |
| PAL | 0.00 | 0.47 | 0.00 | 0.00 | 0.05 | 0.972 |
| STE | 0.01 | 0.20 | 0.33 | 0.15 | 0.21 | 0.770 |
| OLE | 1.52 | 255.38 | 1.04 | 19.69 | 9.73 | 0.988 |
| LNL | 0.19 | 10.79 | 0.45 | 2.90 | 0.79 | 0.973 |
| LIN | 0.06 | 5.53 | 0.01 | 0.08 | 0.26 | 0.984 |
| EIC | 0.42 | 11.65 | 0.30 | 0.23 | 1.32 | 0.956 |
| ERU | 1.13 | 349.94 | 0.41 | 52.84 | 5.73 | 0.994 |



**Fig. S1 Associations among 488 *Brassica napus* accessions according to the data of 10 quality traits according to different ecotype according to the first two principal coordinates (first principal component, PC1, and second principal component, PC2) obtained from a principal component analysis**



**Fig. S2 Associations among 488 *Brassica napus* accessions according to the data of 10 quality traits according to different geographic origin according to the first two principal coordinates (first principal component, PC1, and second principal component, PC2) obtained from a principal component analysis**