

**Supplementary Table 1:** Detection of retrotransposon and MITE in maize by PCR. Primer set 1 and primer set 2 are used to detect retrotransposon while primer set 3 is used to detect MITE. M indicates products of expected size were amplified. Lines with no products by using primer set 1 are highlighted blue and amplified with primer set 2.

| ID | Name    | retro | MITE |
|----|---------|-------|------|
| 1  | CIMBL11 | M     | M    |
| 2  | CIMBL12 | M     | M    |
| 3  | CIMBL13 | M     | M    |
| 4  | CIMBL14 | M     | M    |
| 5  | CIMBL15 | M     | M    |
| 6  | CIMBL16 | M     | M    |
| 7  | CIMBL17 | M     | M    |
| 8  | CIMBL18 | M     | M    |
| 9  | CIMBL19 | M     | M    |
| 10 | CIMBL20 | M     | M    |
| 11 | CIMBL21 | M     | M    |
| 12 | CIMBL22 | M     | M    |
| 13 | CIMBL23 | M     | M    |
| 14 | CIMBL24 | M     | M    |
| 15 | CIMBL25 | M     | M    |
| 16 | CIMBL26 | M     | M    |
| 17 | CIMBL27 | M     | M    |
| 18 | CIMBL28 | M     | M    |
| 19 | CIMBL29 | M     | M    |
| 20 | CIMBL30 | M     | M    |
| 21 | CIMBL31 | M     | M    |
| 22 | CIMBL32 | M*    | M    |
| 23 | CIMBL33 | M     | M    |
| 24 | CIMBL34 | M     | M    |
| 25 | CIMBL35 | M     | M    |
| 26 | CIMBL36 | M     | M    |
| 27 | CIMBL37 | M     | M    |
| 28 | CIMBL38 | M     | M    |
| 29 | CIMBL39 | M     | M    |
| 30 | CIMBL40 | M     | M    |
| 31 | CIMBL41 | M     | M    |
| 32 | CIMBL42 | M     | M    |
| 33 | CIMBL43 | M     | M    |
| 34 | CIMBL44 | M     | M    |
| 35 | CIMBL45 | M     | M    |
| 36 | CIMBL46 | M     | M    |
| 37 | CIMBL47 | M     | M    |

|    |         |    |   |
|----|---------|----|---|
| 38 | CIMBL48 | M  | M |
| 39 | CIMBL49 | M  | M |
| 40 | CIMBL50 | M  | M |
| 41 | CIMBL51 | M* | M |
| 42 | CIMBL52 | M* | M |
| 43 | CIMBL53 | M  | M |
| 44 | CIMBL54 | M  | M |
| 45 | CIMBL55 | M  | M |
| 46 | CIMBL56 | M* | M |
| 47 | CIMBL57 | M  | M |
| 48 | CIMBL58 | M  | M |
| 49 | CIMBL59 | M  | M |
| 50 | CIMBL60 | M  | M |
| 51 | CIMBL61 | M  | M |
| 52 | CIMBL62 | M  | M |
| 53 | CIMBL63 | M  | M |
| 54 | CIMBL64 | M  | M |
| 55 | CIMBL65 | M  | M |
| 56 | CIMBL66 | M  | M |
| 57 | CIMBL67 | M  | M |
| 58 | CIMBL68 | M  | M |
| 59 | CIMBL69 | M  | M |
| 60 | CIMBL70 | M  | M |
| 61 | CIMBL71 | M  | M |
| 62 | CIMBL72 | M  | M |
| 63 | CIMBL73 | M  | M |
| 64 | CIMBL74 | M  | M |
| 65 | CIMBL75 | M  | M |
| 66 | CIMBL76 | M  | M |
| 67 | CIMBL77 | M  | M |
| 68 | CIMBL78 | M  | M |
| 69 | CIMBL79 | M  | M |
| 70 | CIMBL80 | M  | M |
| 71 | CIMBL81 | M  | M |
| 72 | CIMBL82 | M  | M |
| 73 | CIMBL83 | M  | M |
| 74 | CIMBL84 | M  | M |
| 75 | CIMBL85 | M  | M |
| 76 | CIMBL86 | M  | M |
| 77 | CIMBL87 | M  | M |
| 78 | CIMBL88 | M  | M |
| 79 | CIMBL89 | M  | M |
| 80 | CIMBL90 | M  | M |
| 81 | CIMBL91 | M  | M |

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|-----|----------|----|---|
| 82  | CIMBL92  | M  | M |
| 83  | CIMBL93  | M  | M |
| 84  | CIMBL94  | M  | M |
| 85  | CIMBL95  | M  | M |
| 86  | CIMBL96  | M  | M |
| 87  | CIMBL97  | M  | M |
| 88  | CIMBL98  | M  | M |
| 89  | CIMBL99  | M  | M |
| 90  | CIMBL100 | M  | M |
| 91  | CIMBL101 | M  | M |
| 92  | CIMBL102 | M  | M |
| 93  | CIMBL103 | M  | M |
| 94  | CIMBL104 | M  | M |
| 95  | CIMBL105 | M  | M |
| 96  | CIMBL106 | M  | M |
| 97  | CML114   | M  | M |
| 98  | CML115   | M  | M |
| 99  | CML116   | M  | M |
| 100 | CML118   | M  | M |
| 101 | CML121   | M  | M |
| 102 | CML122   | M  | M |
| 103 | CML130   | M  | M |
| 104 | CML134   | M  | M |
| 105 | CML139   | M  | M |
| 106 | CML162   | M* | M |
| 107 | CML163   | M  | M |
| 108 | CML165   | M  | M |
| 109 | CML166   | M  | M |
| 110 | CML169   | M  | M |
| 111 | CML170   | M  | M |
| 112 | CML171   | M  | M |
| 113 | CML172   | M  | M |
| 114 | CML189   | M  | M |
| 115 | CML191   | M  | M |
| 116 | CML192   | M  | M |
| 117 | CML20    | M  | M |
| 118 | CML223   | M* | M |
| 119 | CML225   | M  | M |
| 120 | CML226   | M  | M |
| 121 | CML229   | M  | M |
| 122 | CML26    | M  | M |
| 123 | CML27    | M  | M |
| 124 | CML28    | M  | M |
| 125 | CML282   | M* | M |

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|-----|--------|----|---|
| 126 | CML283 | M  | M |
| 127 | CML285 | M  | M |
| 128 | CML286 | M  | M |
| 129 | CML287 | M  | M |
| 130 | CML289 | M  | M |
| 131 | CML29  | M  | M |
| 132 | CML290 | M  | M |
| 133 | CML298 | M  | M |
| 134 | CML307 | M  | M |
| 135 | CML31  | M  | M |
| 136 | CML32  | M  | M |
| 137 | CML323 | M  | M |
| 138 | CML324 | M  | M |
| 139 | CML325 | M  | M |
| 140 | CML326 | M  | M |
| 141 | CML327 | M  | M |
| 142 | CML338 | M  | M |
| 143 | CML360 | M* | M |
| 144 | CML361 | M  | M |
| 145 | CML364 | M  | M |
| 146 | CML40  | M  | M |
| 147 | CML408 | M  | M |
| 148 | CML411 | M  | M |
| 149 | CML412 | M  | M |
| 150 | CML415 | M  | M |
| 151 | CML422 | M* | M |
| 152 | CML423 | M  | M |
| 153 | CML426 | M  | M |
| 154 | CML428 | M  | M |
| 155 | CML430 | M  | M |
| 156 | CML431 | M  | M |
| 157 | CML432 | M  | M |
| 158 | CML433 | M  | M |
| 159 | CML454 | M  | M |
| 160 | CML465 | M  | M |
| 161 | CML468 | M  | M |
| 162 | CML470 | M  | M |
| 163 | CML471 | M  | M |
| 164 | CML473 | M  | M |
| 165 | CML474 | M  | M |
| 166 | CML493 | M  | M |
| 167 | CML496 | M  | M |
| 168 | CML497 | M  | M |
| 169 | CML50  | M  | M |

|     |          |    |   |
|-----|----------|----|---|
| 170 | CML51    | M  | M |
| 171 | CML69    | M  | M |
| 172 | CML113   | M  | M |
| 173 | CML168   | M  | M |
| 174 | CML228   | M  | M |
| 175 | CML297   | M  | M |
| 176 | CML300   | M  | M |
| 177 | CML304   | M  | M |
| 178 | CML305   | M  | M |
| 179 | CML451   | M  | M |
| 180 | CML479   | M  | M |
| 181 | CML480   | M  | M |
| 182 | CML486   | M  | M |
| 183 | CIMBL1   | M  | M |
| 184 | CIMBL2   | M* | M |
| 185 | CIMBL3   | M  | M |
| 186 | CIMBL4   | M  | M |
| 187 | CIMBL5   | M  | M |
| 188 | CIMBL6   | M  | M |
| 189 | CIMBL7   | M  | M |
| 190 | CIMBL8   | M  | M |
| 191 | CIMBL9   | M  | M |
| 192 | CIMBL10  | M  | M |
| 193 | CIMBL107 | M  | M |
| 194 | CIMBL108 | M  | M |
| 195 | CIMBL109 | M  | M |
| 196 | CIMBL110 | M  | M |
| 197 | CIMBL111 | M  | M |
| 198 | CIMBL112 | M* | M |
| 199 | CIMBL113 | M  | M |
| 200 | CIMBL114 | M  | M |
| 201 | CIMBL115 | M  | M |
| 202 | CIMBL116 | M  | M |
| 203 | CIMBL117 | M  | M |
| 204 | CIMBL118 | M* | M |
| 205 | CIMBL119 | M* | M |
| 206 | CIMBL120 | M  | M |
| 207 | CIMBL121 | M  | M |
| 208 | CIMBL122 | M* | M |
| 209 | CIMBL123 | M  | M |
| 210 | CIMBL124 | M  | M |
| 211 | CIMBL125 | M  | M |
| 212 | CIMBL126 | M  | M |
| 213 | CIMBL127 | M  | M |

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|-----|----------|----|---|
| 214 | CIMBL128 | M  | M |
| 215 | CIMBL129 | M  | M |
| 216 | CIMBL130 | M  | M |
| 217 | CIMBL131 | M  | M |
| 218 | CIMBL132 | M  | M |
| 219 | CIMBL133 | M  | M |
| 220 | CIMBL134 | M  | M |
| 221 | CIMBL135 | M  | M |
| 222 | CIMBL136 | M  | M |
| 223 | CIMBL137 | M  | M |
| 224 | CIMBL138 | M  | M |
| 225 | CIMBL139 | M  | M |
| 226 | CIMBL140 | M  | M |
| 227 | CIMBL141 | M  | M |
| 228 | CIMBL142 | M  | M |
| 229 | CIMBL143 | M  | M |
| 230 | CIMBL144 | M  | M |
| 231 | CIMBL145 | M  | M |
| 232 | CIMBL146 | M  | M |
| 233 | CIMBL147 | M  | M |
| 234 | CIMBL148 | M  | M |
| 235 | CIMBL149 | M  | M |
| 236 | CIMBL150 | M  | M |
| 237 | CIMBL151 | M  | M |
| 238 | CIMBL152 | M  | M |
| 239 | CIMBL153 | M* | M |
| 240 | CIMBL154 | M  | M |
| 241 | CIMBL155 | M* | M |
| 242 | CIMBL156 | M  | M |
| 243 | CIMBL157 | M* | M |
| 244 | By804    | M  | M |
| 245 | By807    | M  | M |
| 246 | By809    | M  | M |
| 247 | By813    | M  | M |
| 248 | By815    | M  | M |
| 249 | By843    | M  | M |
| 250 | By4944   | M  | M |
| 251 | By4960   | M  | M |
| 252 | By855    | M  | M |
| 253 | By4839   | M  | M |
| 254 | Gy220    | M  | M |
| 255 | Gy237    | M  | M |
| 256 | Gy246    | M  | M |
| 257 | Gy386    | M  | M |

|     |          |    |   |
|-----|----------|----|---|
| 258 | Gy798    | M  | M |
| 259 | Gy923    | M  | M |
| 260 | Gy1007   | M  | M |
| 261 | Gy462    | M* | M |
| 262 | Gy1032   | M  | M |
| 263 | Ry684    | M  | M |
| 264 | Ry713    | M  | M |
| 265 | Ry732    | M  | M |
| 266 | Ry737    | M  | M |
| 267 | Ry697    | M  | M |
| 268 | Ry729    | M  | M |
| 269 | Sy999    | M  | M |
| 270 | Sy1052   | M  | M |
| 271 | Sy998    | M  | M |
| 272 | Sy1032   | M  | M |
| 273 | Sy1035   | M  | M |
| 274 | Sy1077   | M  | M |
| 275 | Sy1128   | M* | M |
| 276 | Sy3073   | M  | M |
| 277 | Sy1039   | M  | M |
| 278 | Ye478    | M  | M |
| 279 | Mo17     | M  | M |
| 280 | Zi330    | M  | M |
| 281 | Ye107    | M  | M |
| 282 | S22      | M* | M |
| 283 | Si444    | M  | M |
| 284 | Ye52106  | M* | M |
| 285 | Ye515    | M* | M |
| 286 | 7884-4Ht | M  | M |
| 287 | Zheng22  | M  | M |
| 288 | Shen5003 | M  | M |
| 289 | U8112    | M  | M |
| 290 | HYS      | M  | M |
| 291 | HTH-17   | M  | M |
| 292 | Zheng32  | M  | M |
| 293 | Zheng653 | M  | M |
| 294 | Qi319    | M  | M |
| 295 | Zong31   | M  | M |
| 296 | Dong46   | M  | M |
| 297 | Dong237  | M  | M |
| 298 | Ji846    | M  | M |
| 299 | K10      | M  | M |
| 300 | LK11     | M  | M |
| 301 | Hu803    | M  | M |

|     |           |    |   |
|-----|-----------|----|---|
| 302 | Ji53      | M  | M |
| 303 | HuangC    | M  | M |
| 304 | P178      | M  | M |
| 305 | chuan48-2 | M  | M |
| 306 | Tian77    | M  | M |
| 307 | B73       | M  | M |
| 308 | Si446     | M  | M |
| 309 | C8605     | M  | M |
| 310 | Chang3    | M  | M |
| 311 | Ji853     | M  | M |
| 312 | Tie7922   | M  | M |
| 313 | Ye8001    | M  | M |
| 314 | H21       | M  | M |
| 315 | 832       | M  | M |
| 316 | Ye488     | M  | M |
| 317 | BT1       | M  | M |
| 318 | Dan9046   | M  | M |
| 319 | CY72      | M  | M |
| 320 | Hai268    | M  | M |
| 321 | Hai1134   | M  | M |
| 322 | SW1611    | M  | M |
| 323 | Wu109     | M  | M |
| 324 | Lv28      | M  | M |
| 325 | Zong3     | M  | M |
| 326 | Yu87-1    | M  | M |
| 327 | Yan414    | M  | M |
| 328 | 812       | M* | M |
| 329 | 5311      | M  | M |
| 330 | J4112     | M  | M |
| 331 | P138      | M  | M |
| 332 | Nan21-3   | M  | M |
| 333 | K12       | M  | M |
| 334 | Qi205     | M  | M |
| 335 | Q1261     | M* | M |
| 336 | Shen137   | M  | M |
| 337 | Dan599    | M  | M |
| 338 | MO113     | M  | M |
| 339 | K22       | M  | M |
| 340 | Chang7-2  | M  | M |
| 341 | HZS       | M  | M |
| 342 | Xi502     | M  | M |
| 343 | 5237      | M  | M |
| 344 | WH413     | M  | M |
| 345 | Dan340    | M  | M |

|     |          |    |   |
|-----|----------|----|---|
| 346 | Ji63     | M  | M |
| 347 | S37      | M  | M |
| 348 | 3H-2     | M  | M |
| 349 | Ji842    | M  | M |
| 350 | Jiao51   | M  | M |
| 351 | Lx9801   | M  | M |
| 352 | 81162    | M  | M |
| 353 | 8902     | M  | M |
| 354 | Dan598   | M  | M |
| 355 | ZaC546   | M  | M |
| 356 | Yu374    | M  | M |
| 357 | 4F1      | M  | M |
| 358 | Si434    | M  | M |
| 359 | K14      | M* | M |
| 360 | Cheng698 | M  | M |
| 361 | Zheng58  | M  | M |
| 362 | BS16     | M  | M |
| 363 | A619     | M  | M |
| 364 | CI7      | M  | M |
| 365 | DE.EX    | M  | M |
| 366 | SC55     | M  | M |
| 367 | TX5      | M* | M |
| 368 | HSBN     | M* | M |
| 369 | BGY      | M  | M |
| 370 | BEM      | M  | M |
| 371 | SW92E114 | M  | M |
| 372 | HB       | M  | M |
| 373 | DSB      | M  | M |
| 374 | BZN      | M  | M |
| 375 | 04K5686  | M  | M |
| 376 | WMR      | M  | M |
| 377 | MN       | M  | M |
| 378 | Hua83-2  | M  | M |
| 379 | NMJT     | M  | M |
| 380 | 04K5702  | M  | M |
| 381 | 04K5672  | M  | M |
| 382 | 303WX    | M  | M |
| 383 | Xun971   | M  | M |
| 384 | D047     | M  | M |
| 385 | 647      | M  | M |
| 386 | QTHHSBTS | M  | M |
| 387 | B11      | M  | M |
| 388 | 1323     | M  | M |
| 389 | CA47     | M  | M |

|     |          |    |   |
|-----|----------|----|---|
| 390 | 384-2    | M  | M |
| 391 | Z2018F   | M  | M |
| 392 | M153     | M  | M |
| 393 | M165     | M  | M |
| 394 | 05WN230  | M  | M |
| 395 | GY386B   | M  | M |
| 396 | 05W002   | M  | M |
| 397 | 07KS4    | M  | M |
| 398 | 975-12   | M  | M |
| 399 | M97      | M  | M |
| 400 | JY01     | M  | M |
| 401 | R15X1141 | M  | M |
| 402 | XZ698    | M  | M |
| 403 | ZB648    | M  | M |
| 404 | LY042    | M  | M |
| 405 | FCD0602  | M  | M |
| 406 | NX15     | M  | M |
| 407 | YZ15     | M  | M |
| 408 | LY       | M  | M |
| 409 | CF3      | M  | M |
| 410 | TT16     | M  | M |
| 411 | DH3732   | M  | M |
| 412 | Dan4245  | M  | M |
| 413 | Liao5262 | M  | M |
| 414 | Liao5263 | M  | M |
| 415 | TY1      | M* | M |
| 416 | TY2      | M* | M |
| 417 | 835a     | M  | M |
| 418 | TY3      | M  | M |
| 419 | TY4      | M  | M |
| 420 | TY5      | M* | M |
| 421 | TY6      | M  | M |
| 422 | TY7      | M  | M |
| 423 | TY8      | M  | M |
| 424 | TY9      | M* | M |
| 425 | TY10     | M  | M |
| 426 | TY11     | M  | M |
| 427 | B110     | M  | M |
| 428 | B111     | M  | M |
| 429 | B113     | M* | M |
| 430 | B114     | M  | M |
| 431 | IRF314   | M  | M |
| 432 | 3411     | M  | M |
| 433 | LG001    | M  | M |

|     |          |    |   |
|-----|----------|----|---|
| 434 | 5213     | M  | M |
| 435 | 501      | M  | M |
| 436 | W138     | M  | M |
| 437 | 7381     | M  | M |
| 438 | L3180    | M  | M |
| 439 | 9642     | M  | M |
| 440 | Zheng30  | M  | M |
| 441 | 177      | M  | M |
| 442 | Liao138  | M  | M |
| 443 | 238      | M  | M |
| 444 | Zheng35  | M  | M |
| 445 | 4019     | M  | M |
| 446 | ZZ03     | M  | M |
| 447 | Zhong69  | M  | M |
| 448 | JH59     | M  | M |
| 449 | 150      | M  | M |
| 450 | ZH68     | M  | M |
| 451 | ZZ01     | M* | M |
| 452 | Dan3130  | M  | M |
| 453 | Liao159  | M  | M |
| 454 | Zhi41    | M  | M |
| 455 | Dan360   | M  | M |
| 456 | 1462     | M* | M |
| 457 | JH96C    | M  | M |
| 458 | Si273    | M  | M |
| 459 | 268      | M* | M |
| 460 | B151     | M  | M |
| 461 | Liao5114 | M  | M |
| 462 | Shen135  | M  | M |
| 463 | D863F    | M  | M |
| 464 | 835b     | M* | M |
| 465 | Zheng28  | M* | M |
| 466 | R15      | M  | M |
| 467 | Zheng29  | M  | M |
| 468 | EN25     | M* | M |
| 469 | IRF291   | M  | M |
| 470 | 7327     | M  | M |
| 471 | LXN      | M  | M |
| 472 | DH29     | M  | M |
| 473 | 526018   | M  | M |
| 474 | ES40     | M  | M |
| 475 | 18-599   | M  | M |
| 476 | 9782     | M  | M |
| 477 | R08      | M  | M |

|     |        |    |   |
|-----|--------|----|---|
| 478 | B77    | M  | M |
| 479 | Yun46  | M  | M |
| 480 | GEMS1  | M  | M |
| 481 | GEMS2  | M  | M |
| 482 | GEMS3  | M  | M |
| 483 | GEMS4  | M  | M |
| 484 | GEMS5  | M  | M |
| 485 | GEMS6  | M  | M |
| 486 | GEMS9  | M  | M |
| 487 | GEMS10 | M  | M |
| 488 | GEMS11 | M  | M |
| 489 | GEMS12 | M  | M |
| 490 | GEMS13 | M  | M |
| 491 | GEMS14 | M  | M |
| 492 | GEMS15 | M* | M |
| 493 | GEMS16 | M  | M |
| 494 | GEMS17 | M  | M |
| 495 | GEMS18 | M  | M |
| 496 | GEMS19 | M  | M |
| 497 | GEMS20 | M  | M |
| 498 | GEMS21 | M  | M |
| 499 | GEMS23 | M  | M |
| 500 | GEMS24 | M  | M |
| 501 | GEMS25 | M  | M |
| 502 | GEMS27 | M  | M |
| 503 | GEMS28 | M  | M |
| 504 | GEMS29 | M  | M |
| 505 | GEMS30 | M  | M |
| 506 | GEMS31 | M  | M |
| 507 | GEMS32 | M  | M |
| 508 | GEMS33 | M  | M |
| 509 | GEMS35 | M  | M |
| 510 | GEMS36 | M  | M |
| 511 | GEMS37 | M  | M |
| 512 | GEMS39 | M  | M |
| 513 | GEMS40 | M  | M |
| 514 | GEMS41 | M  | M |
| 515 | GEMS42 | M  | M |
| 516 | GEMS43 | M  | M |
| 517 | GEMS44 | M  | M |
| 518 | GEMS45 | M  | M |
| 519 | GEMS46 | M  | M |
| 520 | GEMS47 | M  | M |
| 521 | GEMS48 | M* | M |

|     |        |    |   |
|-----|--------|----|---|
| 522 | GEMS49 | M  | M |
| 523 | GEMS50 | M  | M |
| 524 | GEMS51 | M  | M |
| 525 | GEMS52 | M  | M |
| 526 | GEMS53 | M  | M |
| 527 | GEMS54 | M  | M |
| 528 | GEMS55 | M  | M |
| 529 | GEMS56 | M  | M |
| 530 | GEMS57 | M  | M |
| 531 | GEMS58 | M  | M |
| 532 | GEMS59 | M  | M |
| 533 | GEMS60 | M  | M |
| 534 | GEMS61 | M  | M |
| 535 | GEMS62 | M  | M |
| 536 | GEMS63 | M  | M |
| 537 | GEMS64 | M  | M |
| 538 | GEMS65 | M* | M |
| 539 | GEMS66 | M  | M |

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\* Using primer set bridging one end of the retrotransposon and the adjacent sequence to amplify, and the amplification product are confirmed by sequencing.