

Supplementary Table S1. Samples of *M. gracilicorne* used in this study.

| Sample ID | Sex, stage, etc. ^a | Collection locality ^b | Collection date | Collector ^c | Host plant ^d | Experimental purposes ^e | Symbiont cultivability ^f | Bacterial 16S rDNA accession numbers ^g |
|-----------------------|-------------------------------|--|-----------------------|------------------------|--|------------------------------------|-------------------------------------|---|
| CKSI13-01 | F | Chikusei, Ibaraki | 25 May 2013 | TH | <i>Sicyos angulatus</i> | SD MP SC | X | LC589990 |
| CKSI13-02 | M | Chikusei, Ibaraki | 25 May 2013 | TH | <i>Sicyos angulatus</i> | SD MP SC | X | LC589991 |
| 13OA01–13OA23 | OA | Chikusei, Ibaraki; offspring of mass-reared adults | 25 May 2013 (parents) | TH | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | SD MP | – | LC590003- LC590025 |
| TSKB13-01 | F | Tsukuba, Ibaraki | 15 Jun 2013 | TH | <i>Gynostemma pentaphyllum</i> | SD MP SC | O | LC589992 |
| TSKB13-02 | F | Tsukuba, Ibaraki | 15 Jun 2013 | TH | <i>Gynostemma pentaphyllum</i> | SD MP SC | O | LC589993 |
| KMMT13-01 | F | Aso, Kumamoto | Jul 2013 | TT | <i>Trichosanthes kirilowii</i> | SD MP SC | O | LC589994 |
| KTKS13-01 | F | Kita-Kyushu, Fukuoka | 12 Jun 2013 | MB | No data (on stone) | SD MP SC | O | LC589995 |
| FKYM13-01 | F | Fukuyama, Hiroshima | 21 Jun 2013 | AK | No data | SD MP SC | O | LC589996 |
| MYZK13-01 | F | Miyazaki, Miyazaki | 22 Jun 2013 | KO | <i>Trichosanthes cucumeroides</i> | SD MP SC | O | LC589997 |
| MYZK13-02 | M | Miyazaki, Miyazaki | 22 Jun 2013 | KO | <i>Trichosanthes cucumeroides</i> | SD MP SC | O | LC589998 |
| KGSM13-01 | F | Kagoshima, Kagoshima | 18 Jun 2013 | TT | <i>Trichosanthes kirilowii</i> | SD MP SC | O | LC589999 |
| KGSM13-02 | F | Kagoshima, Kagoshima | 18 Jun 2013 | TT | <i>Trichosanthes kirilowii</i> | SD MP SC | O | LC590000 |
| TCHG13-01 | F | Tochigi, Tochigi | 22 Apr 2013 | SM | No data (hibernating) | SD MP SC | X | LC590001 |
| TCHG13-02 | F | Tochigi, Tochigi | 22 Apr 2013 | SM | No data (hibernating) | SD MP SC | O | LC590002 |
| 19OP+Sym01–19OP+Sym03 | OP | Chikusei, Ibaraki; offspring of mass-reared adults | 4 Jun 2019 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC | – | – |
| 19OP–Sym01–19OP–Sym03 | OP | Chikusei, Ibaraki; offspring of mass-reared adults | 4 Jun 2019 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC | – | – |
| 20OP+Sym01–20OP+Sym02 | OP | Chikusei, Ibaraki; offspring of mass-reared adults | 14 May 2020 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC | – | – |
| 20OP–Sym01–20OP–Sym02 | OP | Chikusei, Ibaraki; offspring of mass-reared adults | 14 May 2020 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC | – | – |
| 20OA+Sym01–20OA+Sym08 | OA | Chikusei, Ibaraki; adults from 20OP+Sym01-02 | 14 May 2020 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC SD MP | – | LC594073–LC594080 |
| 20OA–Sym01–20OA–Sym08 | OA | Chikusei, Ibaraki; adults from 20OP–Sym01-02 | 14 May 2020 (parents) | TN | <i>Sicyos angulatus</i> -> <i>Cucumis sativus</i> | MSC SD MP | – | LC594081–LC594088 |
| CKSI20-01 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | SD MP SC | O | LC594116 |
| CKSI20-02 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | SD MP SC | O | LC594125 |
| CKSI20-03 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | SD MP SC | O | LC594134 |
| CKSI20-04 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | FISH | – | – |
| CKSI20-05 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | FISH | – | – |
| CKSI20-06 | M | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | FISH | – | – |
| CKSI20-07 | M | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | FISH | – | – |
| CKSI20-08 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | TEM | – | – |
| CKSI20-09 | F | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | TEM | – | – |
| CKSI20-10 | M | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | TEM | – | – |
| CKSI20-11 | M | Chikusei, Ibaraki | 14 May 2020 | TN TF BH | <i>Sicyos angulatus</i> | TEM | – | – |
| CKSI20-12 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594143–LC594175 |
| CKSI20-13 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594176–LC594208 |
| CKSI20-14 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594209–LC594241 |

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|-----------|---------|-------------------|-------------|-------|--------------------------------|----------|---|-----------------------------------|
| CKSI20-15 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594242–LC594274 |
| CKSI20-16 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594275–LC594307 |
| CKSI20-17 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594308–LC594340 |
| CKSI20-18 | F OE ON | Chikusei, Ibaraki | 23 Jul 2020 | TF | <i>Sicyos angulatus</i> | SD MP | – | LC594341–LC594373 |
| CHBA20-01 | F | Chiba, Chiba | 23 May 2020 | TN | <i>Sicyos angulatus</i> | SD MP SC | O | LC594089 |
| CHBA20-02 | F | Chiba, Chiba | 23 May 2020 | TN | <i>Sicyos angulatus</i> | SD MP SC | O | LC594098 |
| CHBA20-03 | F | Chiba, Chiba | 23 May 2020 | TN | <i>Sicyos angulatus</i> | SD MP SC | O | LC594107 |
| FKOK20-01 | F | Fukuoka, Fukuoka | 23 May 2020 | TH | <i>Gynostemma pentaphyllum</i> | SD MP SC | O | LC594374 |
| FKOK20-02 | F | Fukuoka, Fukuoka | 23 May 2020 | TH | <i>Gynostemma pentaphyllum</i> | SD MP SC | O | LC594383 |
| FKOK20-03 | F | Fukuoka, Fukuoka | 23 May 2020 | TH | <i>Gynostemma pentaphyllum</i> | SD MP SC | O | LC594392 |
| TKSK20-01 | F | Takasaki, Gumma | 24 May 2020 | TN BH | <i>Sicyos angulatus</i> | SD MP SC | X | LC594401 |
| TKSK20-02 | F | Takasaki, Gumma | 24 May 2020 | TN BH | <i>Sicyos angulatus</i> | SD MP SC | X | LC594410 |
| TKSK20-03 | F | Takasaki, Gumma | 24 May 2020 | TN BH | <i>Sicyos angulatus</i> | SD MP SC | X | LC594419 |

^aF, adult female; M, adult male; OE, offspring egg; ON, offspring nymph; OA, offspring adult reared from egg on cucumbers in the laboratory; OP, offspring population reared from eggs on cucumbers in the laboratory.

^bAll localities are in Japan.

^cAK, Atsushi Kikuchi; BH, Bin Hirota; KO, Kyosuke Okuda; MB, Mitsuo Baba; SM, Satoshi Maehara; TF, Takema Fukatsu; TH, Takahiro Hosokawa; TN, Takanori Nishino; TT, Taku Tsukada.

^d*Sicyos angulatus* -> *Cucumis sativus* means that insects collected from *S. angulatus* in the field were reared on cucumbers *C. sativus* in the laboratory.

^eMSC, monitoring of survival curve; MP, molecular phylogenetic analysis; SD, symbiont detection and characterization; SC, symbiont culturing; FISH, fluorescence in situ hybridization of symbiotic bacteria; TEM, transmission electron microscopy of symbiotic bacteria.

^fSymbiont cultivability evaluated by homogenizing and spreading M4 homogenates onto LB agar plates.

^gDNA Data Bank of Japan nucleotide sequence accession numbers.