The first record of *Omosita nearctica* Kirejtshuk (Coleoptera, Nitidulidae) in South Africa, with the first description of its mature larva

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Abstract

Sap beetles of the genus *Omosita* Erichson are stored-product pests that are also associated with carrion, potentially making them biosecurity risks and forensic tools. The discovery of a specimen of the Nearctic species *Omosita nearctica* Kirejtshuk in South Africa prompted an investigation a decade later to determine if this species had established itself in the country, which was confirmed by the collection of further breeding specimens that also facilitated the first description of mature larvae of *O. nearctica*. A new key to adults of all *Omosita* species is presented.

Keywords

Biosecurity, forensic entomology, invasion biology, larval morphology, molecular identification, morphological key
Introduction

Many insects associated with stored products have been moved between continents following humans’ colonisation of new places. In the case of cryptogenic species, this invasion process has been so thorough that the geographical origin of the insect invaders is no longer clear, e.g. the Hide Beetle, *Dermestes maculatus* DeGeer, 1774 (Coleoptera: Dermestidae) (Mroczkowski 1968). In other cases, these invasive species are not noticed for years even though they may be well-known pests in other countries, e.g. the Oriental Latrine Fly, *Chrysomya megacephala* (Fabricius, 1794) (Diptera: Calliphoridae) in South Africa (Williams and Villet 2006; Badenhorst and Villet 2018). Insects, and particularly beetles (Midgley et al. 2009), associated with stored animal products, are often of significance in forensic entomology and biosecurity, and keeping track of new members of the carrion insect community in a particular country is important in both of these contexts.

The sap beetle family Nitidulidae has approximately 350 genera and over 4500 species (Lee et al. 2020). The Nitidulidae in Africa have not been well studied and so what is known of them is limited (Kirejtshuk 2001). There are seven recognised species in the genus *Omosita* Erichson, 1843 – *O. discoidea*, *O. colon*, *O. depressa*, *O. funesta*, *O. smetanai*, *O. japonica* and *O. nearctica* (Reitter 1873, 1874; Kirejtshuk 1987; Lee et al. 2015). A specimen of *O. discoidea* in the Naturhistoriska Riksmuseet, Stockholm*, was collected by Gustav de Vylder (Lee et al. 2015), probably during his stays in Cape Town in 1871–1873 and 1879–1885 (de Vylder 1998); no other published records of *Omosita* in the Afrotropical Region were found.

At least some sap beetles of the genus *Omosita* are relevant in forensic entomological and biosecurity contexts because they are occasional pests of stored products and can be abundant on carrion and corpses (Hinton 1945; Shubeck et al. 1977; Jelinek 1999; Kočárek 2003; Ewing and Cline 2005; Schlechter 2008; Saloña et al. 2010; Lee et al. 2015; Lyu et al. 2016; Torres et al. 2018; Lee et al. 2020). Several *Omosita* species have been translocated around the globe, e.g. the Palaearctic species *Omosita colon* (Linnaeus, 1758) and *Omosita discoidea* (Fabricius, 1775) have been reported from Australia and New Zealand (Blackburn 1903; Carlton and Leschen 2007); *O. colon* has been recorded on Pitt Island, 800 km east of New Zealand (Alfken 1904; Emberson 1998); and the Mexican species *Omosita funesta* Reitter, 1873 is reported from Spain (Audisio 1990). Despite their applied significance and widespread distribution, literature about the distribution of *Omosita* species is demonstrably scattered.

*Omosita nearctica* Kirejtshuk, 1987 was described from North America (Kirejtshuk 1987), but nothing has yet been published about its biology. Some North American records of *O. colon* published or identified before 1987 may actually represent *O. nearctica*, which was only recognised as a separate species in that year (Kirejtshuk 1987).

* The report of a specimen in the Natural History Museum, London (Lee et al. 2015) is a lapsus calami (Kirejtshuk, pers. comm.).
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The collection of a single specimen of *Omosita nearctica* in August 2001 in South Africa suggested the introduction of *O. nearctica* to this country. This paper reports this discovery, confirms the breeding of *O. nearctica* in South Africa, and provides the first description of its larva.

**Materials and methods**

**Specimen collection**

An adult specimen of *Omosita nearctica* was collected in a trap baited with 50 g of fresh chicken liver in Makhanda (formerly Grahamstown), Eastern Cape province, South Africa, in August 2001, during a study of the seasonal distribution of forensically important flies (Villet et al. 2017; Williams and Villet 2019). The specimen was discovered in 2012 among the ethanol-preserved flies. It was mounted and deposited in the Albany Museum, Makhanda, South Africa (specimen number AM 66416**).

Cooked sheep shank bones were placed in custom-made traps hung about 50 cm above ground in trees at municipal rubbish dumps (or landfills) in Makhanda (33.291°S, 26.492°E) in February 2012 and 2013, and nearby Port Alfred (33.568°S, 26.879°E) in February 2013. The traps were checked regularly and when beetles were caught, they were taken back to Rhodes University and caged with uncooked beef shin bones. Larvae were discovered feeding on the fatty bones in March 2013. The adults (unsexed) and larvae were preserved in 96% ethanol. Five larval specimens were deposited in the wet collection of the KwaZulu-Natal Museum, Pietermaritzburg, South Africa (specimen number NMSA-COL 1405–1409). Adult specimens were card mounted and two specimens were deposited in the KwaZulu-Natal Museum (specimen number NMSA-COL 1898 and NMSA-COL 1410), two in the South African National Collection of Insects, Pretoria, South Africa (accession number SANC-COLG-00021) and two in the Albany Museum, Makhanda, South Africa (specimen numbers AM 101483 and AM 101484).

**Identification**

The adult beetles (n = 28) were identified from their morphology using the keys in Jelínek (1999) and Lee et al. (2015) and the description and illustrations in Kirejtshuk (1987). A new diagnostic key to the adults of the seven accepted species of *Omosita* is presented in Appendix 1.

One hind leg of a single beetle (NMSA-COL 1898) was used for DNA analysis. DNA was extracted using the Qiagen DNeasy tissue kit (Qiagen, Inc., Valencia, CA)

**This specimen is misidentified on the Global Biodiversity Information Facility (GBIF) as *Omosita japonica* (Gess and Ranwashe 2017).**
according to the manufacturer’s instructions. A portion of the cytochrome oxidase I (COI) gene was sequenced using the LCO1490 forward (5’-GGTCAACAAAT-CATAAAGATATTGG-3’) and HCO2198 reverse (5’-TAAACTTCAGGGTGAC-CAAAAAAT-3’) primers. Polymerase chain reaction (PCR) amplification was conducted and the PCR product was sequenced by Macrogen Inc, Seoul, South Korea (https://dna.macrogen-europe.com/). The COI sequence was run through the Basic Local Alignment Search Tool (BLAST – https://blast.ncbi.nlm.nih.gov) to confirm the morphological identification.

To facilitate comparative biology, a molecular phylogeny of four of the seven species of *Omosita* was estimated. Additional COI sequences of the four widespread *Omosita* species were downloaded from the Barcode of Life Data System v4 (BOLD) (Table 1) and analysed together with the new sequence. *Brachypeplus glaber* LeConte (Nitidulidae: Cillaeinae) and two species of *Nitidula* Fabricius (Nitidulidae: Nitidulinae) were used as outgroups. Bayesian inference analyses were performed with MrBayes (Huelsenbeck and Ronquist 2001) using the best-fitting nucleotide substitution mode (GTR+G) from jModelTest (Posada 2008). One cold and three hot chains were run for 5 000 000 generations, sampling every 1 000 generations with burn-in of 1 000 samples (20%).

**Larval morphology**

Three mature larvae were prepared for scanning electron microscopy (SEM) by critical-point drying and sputter-coating with gold (NMSA-COL 1402). The specimens were viewed with a Zeiss Evo LS 15 SEM at the University of KwaZulu-Natal’s Microscopy and Microanalysis Unit, Pietermaritzburg, South Africa. Two mature larvae were slide mounted using standard protocols and viewed using a Leica compound microscope (NMSA-COL 1403 and 1404). A further five mature larvae were examined using a Leica dissecting microscope (NMSA-COL 1405–1409). Measurements were taken using a graduated eye-piece.

**Results**

**Morphological identification**

Twenty-eight adult specimens of *Omosita* were collected in Makhanda (1 in 2001, 12 in February 2012 and 15 in February 2013) but none in Port Alfred. The beetles keyed out as *Omosita colon* using the keys to Palaearctic species of *Omosita* presented by Jelinek (1999) and Lee et al. (2015), but these keys necessarily do not include *O. nearctica*, which is as yet unknown from the Palaearctic. Kirejtshuk (1987) compared his newly described *O. nearctica* with *O. colon* and his description and figures confirmed that our specimens were *O. nearctica*. 
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**Table 1.** Sequences from NCBI GenBank and BOLD used in the Bayesian inference analysis. New sequences are set in bold typeface.

| Species | Location | GenBank accession number | BOLD Sequence ID |
|---------|----------|--------------------------|------------------|
| *Omosita colon* | Athenstedt, Germany | KU907100 | GCOL10982-16.COI-5P |
| | Athenstedt, Germany | KU910800 | GCOL10988-16.COI-5P |
| | Edenkoben-Rhodt, Villa Ludwisgoheo, Germany | KM441201 | FBCC0036-13.COI-5P |
| | Haembach, Haembacher Teich, Halde, Germany | KU913847 | GCOL5018-16.COI-5P |
| | Hailiniemi, Finland | KJ965999 | COLFE1417-13.COI-5P |
| | Hailiniemi, Finland | KJ966608 | COLFE1416-13.COI-5P |
| | Kallvik, Helsinki, Finland | KJ965633 | COLFD1167-13.COI-5P |
| | Kallvik, Helsinki, Finland | KJ967401 | COLFD168-12.COI-5P |
| | Lauttasari, Finland | KJ965605 | COLFE421-12.COI-5P |
| | Nobitz-Klausa, Leinawald, Germany | KM446224 | GBCOL020-12.COI-5P |
| | Wesel-Diersfordt, Diersfordter Wald Gatter, Germany | KM452483 | FBCOC604-10.COI-5P |
| *Omosita depressa* | Arnsberg-Breitenbruch, NWZ Hellerberg, Germany | KM444298 | FBCOH678-12.COI-5P |
| | Bornheim-Hemmerich, Ortslage, Germany | KM4446940 | FBCOG1013-12.COI-5P |
| | Nobitz-Klausa, Leinawald, Germany | KM449233 | GBCOC743-12.COI-5P |
| | Oberheimbach, Franzosenkopf, Germany | KM439454 | GBCOE444-13.COI-5P |
| *Omosita discoidea* | Bornheim-Hemmerich, Ortslage, Germany | KU919455 | GCOL7562-16.COI-5P |
| | Langenthal, Germany | KU912774 | GCOL9483-16.COI-5P |
| | Rowe Tamarack Trail, Canada | KM849291 | SWLCC101-13.COI-5P |
| | Saalealtrarm, Germany | KU909461 | GCOL1957-16.COI-5P |
| | Schaidt, NWR Stuttperfch, Germany | KM445991 | FBCOE490-12.COI-5P |
| | Staerkerwald, Germany | KU916825 | GCOL7701-16.COI-5P |
| | Wandersleben, Burg Gleichen, Germany | KU919608 | GCOL9399-16.COI-5P |
| *Omosita neartica* | Charitable Research Reserve, Canada | MG054067 | RRSSC3383-15.COI-5P |
| *Omosita neartica* | Makanda (previously Grahamstown), South Africa | MT371766 | – |
| *Omosita neartica* | Puslinch, Canada | MG058703 | COLON045-10.COI-5P |
| *Omosita neartica* | Sable Island National Park Reserve, Canada | KR916043 | CNSIB573-15.COI-5P |
| *Omosita sp.* | Kawartha Lakes, Canada | – | BARSL067-16.COI-5P |

**Outgroups**

| Brachypeplus glaber | United States of America | KC491232 | GBC115295-13.COI-5P |
| Nitidula bipunctata | Rana u Loun, Oblik, Czech Republic | KM452214 | GBCOU1431-13.COI-5P |
| | Langenthal, Germany | KU909854 | GCOL9484-16.COI-5P |
| | Wandersleben, Burg Gleichen, Germany | KU908969 | GCOL9400-16.COI-5P |
| | Hailiniemi, Finland | KJ962313 | COLFE1409-13.COI-5P |
| | | KJ965428 | COLFE1410-13.COI-5P |
| | | KJ963473 | COLFE1411-13.COI-5P |
| | | KJ964776 | COLFE1412-13.COI-5P |
| | Rana u Loun, Oblik, Czech Republic | KM440272 | GBCOU1469-13.COI-5P |
| | | KM444376 | GBCOU1470-13.COI-5P |
| | | KM444149 | GBCOU1861-13.COI-5P |
| | | KU915079 | GCOL6778-16.COI-5P |

*Misidentification (see Fig. 2).*

**Molecular identification**

The partial COI sequence from one specimen (Genbank accession number: MT371766, NMSA-COL 1898) was 656 bp long and aligned easily with the other sequences. It had a 100% BLAST match to *O. neartica*, with the highest match to the other sequences. In the Bayesian inference tree (Fig. 2), the new sequence forms a clade exclusively containing other *O. neartica* sequences.
Table 2. BLAST metrics of similarity for *Omosita nearctica* sequence from Makhanda, South Africa.

| Species             | % Coverage | % Match | E-value |
|---------------------|------------|---------|---------|
| *Omosita nearctica* | 100%       | 100%    | 0.0     |
| *Omosita colon*     | 99%        | 89.3%   | 0.0     |
| *Omosita discoidea* | 99%        | 88.21%  | 0.0     |
| *Omosita depressa*  | –          | No significant similarity |  |
| *Nitidula rufipes*  | 100%       | 87.82%  | 0.0     |
| *Nitidula bipunctata* | –       | No significant similarity |  |

**Taxonomy**

**Diagnosis of adult**

Body length 2.4–3.7 mm, oblong ovate, sparsely pubescent, testaceous except for piceous markings on anterior half of elytra, and pale markings on lateral pronotal margins and posterior half of elytra; antennal club not longer than wide; pronotum transverse, concave anteriorly and arcuate laterally, with sides converging more apically than basally, with two oval depressions before scutellum; elytra jointly at least 0.75 as wide as their length, their apices obliquely rounded, forming a common arc and usually exposing one abdominal tergite (Fig. 1). The phallobase is subparallel, with the parameres fused and not divergent; the tegmen is anteriorly transverse and shallowly excavate apically.

*Omosita colon* differs most notably from *O. nearctica* in the shape of the antennal club which is elongate-oval, much longer than wide and its body shape which is oval. *Omosita discoidea* differs from *O. nearctica* in the pronotum colour which is black in the centre and testaceous towards the edges and the antennal club which is longer than wide (Kirejtshuk 1987; Lee et al. 2015)

**Description of mature larva**

**Measurements.** Body length 4 mm. Head capsule 0.5 mm wide.

**Body** (Fig. 3). Body campodeiform; subdepressed; widest in abdominal region; white or yellow; uniformly pigmented; poorly sclerotised. Head and all terga with scattered setae; body setae with apices entire.

**Head** (Figs 4–6). Head capsule (Fig. 4) 2.3 times as wide as long (excluding the labrum); trapezoidal, tapered towards mouthparts; lateral margins straight, at most gently convex; dorsal hind margin slightly retracted; ventral hind margin strongly retracted; granular or tuberculate; with one dorsal and no ventral stemma on each side. Antenna with three antennomeres. Basal antennomere almost as long as wide; without setae. Second antennomere as long or slightly longer than first; with mesal, subapical sensory area bearing a large cone; with sensory appendix about two thirds the length of third antennomere; with setae, including one directly proximal to sensory area. Third antennomere about as long as basal antennomere; setose with a group of minute apical setae. Frontal sutures impressed, reaching near antennal insertions; frontoclypeal suture distinct laterally, obsolete medially. Clypeus trap-
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Figure 1. *Omosita nearctica* adult, dorsal and ventral view, captured in February 2013 in Makhanda, South Africa. Scale bar: 0.5 mm.

Figure 2. Bayesian inference tree of COI sequences. Posterior probability values are shown on branches. Red text is the South African sequence generated in this study.
Figure 3. *Omosita nearctica* larva – dorsal (L) and ventral (R) views. hc = head capsule m = mesothorax, mt = metathorax, p = prothorax, pu = pregomphus, sp = spiracle, st = stemmata, u = urogomphus, 1–9 = abdominal tergites. Scale bar: 0.5 mm.
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Figures 4–6. 4 SEM dorsal view of head capsule and thorax of *Omosita nearctica* larva. ant = antenna, cly = clypeus, hc = head capsule, m = mesothorax, mt = metathorax, p = prothorax 5 SEM ventral view of left mandible of *Omosita nearctica* larva. mo = mola, pc = prostheca 6 SEM ventral view of head of *Omosita nearctica* larva. ant = antenna, la = labrum, lp = labial palp, mb = mandible, mn = mentum, mx = maxilla, mxp = maxillary palp, sm = submentum. Scale bars: 500 μm (4), 20 μm (5, 6).

Ezoidal; with three pairs of submarginal setae; clypeal protuberances weak. Clypeo-labral suture nearly straight.

Mandible (Fig. 5) apex bidentate; with two subequal lateroventral setae. Prostheca consists of several large lobes; bearing a lightly sclerotized projection at base. Mola transversely ridged. Maxilla elongated. Maxillary palp three-segmented; with third joint longer than first or second. Galea with large, dense apical brush. Lacinia partially fused to galea. Mala enlarged inner-distally; bearing rather sparsely scattered microtrichia. Labium about 1.5 times as long as wide. Labial palp one-segmented; set close at base of labium. Ligula strongly produced. Mentum indistinctly separated from submentum. Submentum with two pairs of setae, one proximal and one distal (Fig. 6).

Thorax (Figs 4, 7). Thoracic tergites (Fig. 4) partially spanning dorsum; medially divided into paratergites. Meso- and metathoracic paraterga small; transversely rectangular; weakly rugose; slightly raised and set close together on mesothorax and touching on metathorax.
Legs (Fig. 7). Femur 1.5 times longer than wide. Tibia twice as long as wide. Tarsungulus slightly longer than half of tibia; moderately, evenly curved. Forelegs slightly shorter than other legs.

Abdomen (Figs 3, 8, 9). Abdomen about three times as long as thorax (Fig. 3). Abdominal tergites T1-T8 about one fourth as wide as body; medially divided into paratergites. Abdominal paratergites transversely rectangular, weakly rugose, slightly raised, and touching. Pregomphi on ninth tergite, small. Urogomphi (Fig. 8) on ninth tergite unsegmented, half the length of ninth tergum; (viewed dorsally) parallel; (viewed laterally) gradually recurved anteriorly (Fig. 9a). Abdominal spiracles exposed; in posterolateral angles of segment. Spiracular tubes present, longer on segments A7 and, particularly, A8; on A8, as wide as tall. Abdominal sternites unsclerotised; intersternal membranes with shagreened patch along anterior margin.

**Figures 7, 8.** 7 SEM of hind leg of *Omosita nearctica* larva. co = coxa, fe = femur, ti = tibia, tr = tarsungulus 8 SEM dorsal view of final segments of the abdomen of *Omosita nearctica* larva. pu = pregomphus, sp = spiracle, u = urogomphus, 6–9 = abdominal tergites. Scale bars: 100 μm (7), 200 μm (8).

**Figure 9.** Lateral view of terminal end of *Omosita nearctica* (a) and *O. colon* (b). pu = pregomphus, u = urogomphus. Not to same scale.
Discussion

This study presents the first record of *Omosita nearctica* in South Africa and confirms that it is established as a self-sustaining, breeding alien invasive species in the Eastern Cape Province of South Africa. The COI gene (Fig. 2) agreed with the morphological identification of the beetles as *O. nearctica*. The sequence from this study grouped together in a clade with three other sequences of *O. nearctica* that were separated from its sister clade, *O. colon*, with 100% posterior probability (Fig. 2). One sequence (BOLD Public Record COLON045-10.COI-5P) identified as *O. nearctica* grouped unambiguously with the *O. discoidea* clade.

The morphological character states listed in Table 3 may be used to differentiate the mature larva of *O. nearctica* from that of *O. colon*, the only other species of *Omosita* for which the larva has been described (Eichelbaum 1903; Verhoeff 1923; Hinton 1945; Böving and Rozen 1962; Hayashi 1978; Díaz-Aranda et al. 2018). The description of the urogomphi of *O. colon* by Hayashi (1978) differs from the description by Díaz-Aranda et al. (2018). Hayashi (1978) describes them as short and Díaz-Aranda et al. (2018) states they are half the length of the ninth tergite which appears to be more accurate (Fig 9b). It must be noted that the pregomphi and urogomphi are all referred to as urogomphi by Díaz-Aranda et al. (2018). It is crucial to recognise that because *O. nearctica* was recognised only in 1987, prior references to *O. colon* larvae from the Nearctic (e.g. Hinton 1945; Böving and Rozen 1962) may be in error.

The collection of adults in Makhanda in 2001, 2012 and 2013 confirmed that *O. nearctica* has probably established in South Africa. This is important in the global context of this species as it has apparently never been recorded outside North America (GBIF.org 2020). The small size, furtive habits and internationally traded diets of sap beetles in general make them good candidates for transport around the world. For instance, at least 32 extralimital species have established in Europe (Jelínek et al. 2016). Most of these species feed on ripening and decaying fruit, but *O. funesta* was imported from Mexico to Teruel, Spain in 1931, “probably on imported sausages” (Jelínek et al.

Table 3. Character states differentiating the known larvae of *Omosita* species. The character states for *O. colon* were derived from consideration of descriptions by Eichelbaum (1903), Verhoeff (1923), Hayashi (1978), Díaz-Aranda et al. (2018). North American descriptions of larvae of *O. colon* that predate the description of *O. nearctica* (Hinton 1945; Böving and Rozen 1962; Díaz-Aranda et al. 2018) were not used because they may involve unwitting misidentifications.

| Character                        | *Omosita nearctica*            | *Omosita colon*                |
|----------------------------------|---------------------------------|---------------------------------|
| Head capsule                     | 2.3 times as wide as long (excluding labrum) | 1.4 times as wide as long (excluding labrum) |
| 2nd antennomere                  | with setae, including one directly proximal to sensory area | without setae                  |
| Sensory appendix of 2nd antennomere | about two thirds as long as 3rd antennomere | about half as long as 3rd antennomere |
| Mola                             | transversely ridged             | transversely ridged and asperated |
| Abdominal paratergites           | touching in midline             | set fairly close together but not touching in midline |
| Spiracular tubes on A8           | as wide as tall                 | wider than tall                 |
Species of *Omosita* are generally associated with human middens and animal remains (Hinton 1945; Shubeck et al. 1977; Jelínek 1999; Kočárek 2003; Ewing and Cline 2005; Schlechter 2008; Saloña et al. 2010; Lee et al. 2015; Lyu et al. 2016; Torres et al. 2018), so it is less obvious how they were transported to Africa. *Omosita nearctica* was probably introduced to South Africa on stored products imported through a port or airport. Given the age and remoteness of some austral introductions of *Omosita* (Blackburn 1903; Alfken 1904; Jelínek et al. 2016), it is possible that the population established well before it was discovered.

Their presence in Makhanda (E. Cape, RSA) suggests that they have been in South Africa for many years, since the town has no international airport and the nearest commercial harbours are over 120 km away. The failure to find specimens in Port Alfred (E. Cape, RSA) is ambiguous evidence of the species’ distribution because the sampling effort was limited.

Nothing is published about the biology of *O. nearctica* (Kirejtshuk, 1987). That *O. nearctica* larvae feed on cooked sheep bones suggests that this species feeds on saponified oils and decomposing material, like at least some other species in its genus (Lee et al. 2015; Lyu et al. 2016). In China, *O. colon* was the only species of beetle observed breaking down adipocere on corpses, potentially giving that species specific significance in medico-criminal forensic entomology (Lyu et al. 2016). The similar diets and close relationship (Fig. 2) of *O. colon* and *O. nearctica* imply that the latter species may be similarly useful (Midgley et al. 2009). Beetles associated with stored animal products are often relevant to biosecurity. Further studies on the biology of this species should monitor its global spread and determine its usefulness in forensic entomology. The description of the mature larva will assist in identifying this species where only larvae are found associated with stored products, corpses or carcasses.

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Appendix 1

Key to adults of the species of the genus *Omosita* (based on diagnostic character states proposed by Reitter 1873, 1874; Kirejtshuk 1987; Jelínek 1999 and Lee et al 2015).

1  Pronotum with convex median area not demarcated from explanate lateral margins by grooves.............................................................................................................2
   – Pronotum with convex median area demarcated from explanate lateral margins by roughly parallel, arcuate grooves..................................................................5

2(1) Antennal club elongate-oval, distinctly longer than wide................................3
   – Antennal club rounded or subtriangular, not longer than wide ..................4

3(2) Elytra 1.5 times longer than their combined width. Pronotum narrowly explanate laterally; anterior margin shallowly, arcuately notched. Antennal club not constricted in middle..........................................................*Omosita funesta*
   – Elytra at most 1.3 times longer than their combined width. Pronotum widely explanate laterally; anterior margin deeply notched; Antennal club constricted in middle ..........................................................*Omosita discoidea*

4(2) Antennal club rounded, about as long as wide. Mentum without distinct sulcus along posterior border.................................*Omosita nearctica*
   – Antennal club broad or subquadrangular to obovate to trapezoidal or subtriangular, usually shorter than wide. Mentum with distinct transverse sulcus along posterior border .........................................................*Omosita japonica*

5(1) Grooves between convex median area of pronotum and its explanate margins indistinct.................................................................*Omosita colon*
   – Grooves between convex median area of pronotum and its explanate margins distinct...........................................................................................................6

6(5) Pronotum narrowly explanate laterally. Antennal club not constricted in middle. Postmentum with lateral margins raised and sharp; its punctation rugose .......... .................................................................*Omosita smetanai*
   – Pronotum widely explanate laterally. Antennal club constricted in middle. Postmentum with lateral edges margins; its punctation simple and widely spaced ....... .............................................................................*Omosita depressa*