Koleopterologische Rundschau	91	103–112	Wien, Oktober 2021

Thinodromus diffusus (CASEY, 1889) and *T. lapsus* (CASEY, 1889): partially sympatric sibling species?

(Coleoptera: Staphylinidae: Oxytelinae)

Gy. MAKRANCZY

Abstract

The status of *Thinodromus diffusus* (CASEY, 1889) and its sibling species, *T. lapsus* (CASEY, 1889) (Coleoptera: Staphylinidae: Oxytelinae), are reviewed. New distribution records are added. The species are illustrated by colour photographs and scanning electron micrographs, the terminalia and genitalia by line drawings.

Key words: Coleoptera, Staphylinidae, Oxytelinae, *Thinodromus diffusus* group, taxonomy, Nearctic Region.

Introduction

The genus *Thinodromus* KRAATZ, 1857 is widely distributed, remarkably speciose and morphologically diverse. Its demarcation is still under dispute as several species groups have problematic affiliation.

The Nearctic *Thinodromus diffusus* species group was briefly discussed in MAKRANCZY (2018) and one of the three included species, *T. phloeoporinus* (LECONTE, 1877), has received a detailed treatment. *Thinodromus diffusus* was dealt with and partially illustrated because of its phylogenetic importance (MAKRANCZY 2006). The two known western species, *T. diffusus* (CASEY, 1889) and *T. lapsus* (CASEY, 1889), were described based on single female specimens from the very same locality (California, Nevada Co., Truckee, 5800 ft.), possibly from the same sample. These sibling species were distinguished based on external features that can be subject to pronounced variation. In contrast to *Thinodromus diffusus* (e.g., HATCH 1957, MAKRANCZY 2006), *T. lapsus* has not been mentioned since the original description except in catalogues, and its validity remained unchecked. On a personal visit in USNM in 2002, the author had the opportunity to briefly examine the holotypes of both *T. diffusus* (Type USNM 37222) and *T. lapsus* (Type USNM 37213). He also noted that the two taxa are very close, and he felt that they may represent the same species. When examining 20 specimens collected by Michael Schülke with a car-net, they could easily be sorted to two distinct species. Examination of the terminalia and genitalia also confirmed that the specimens represent in fact two separate sympatric taxa.

The purpose of this contribution is to illustrate the diagnostic traits in the male terminalia and genitalia of *T. diffusus* and *T. lapsus*. Externally, they are also sufficiently different, although the sample size is small and one can expect much greater variation, especially in colour, to the point that they may be confusable. It is also demonstrated that *T. lapsus* is also widely distributed, and its occurrence at the type locality is at least to be expected (if not certain). In some localities both species occur together.

At present, it cannot be ascertained that the holotype of *T. lapsus* really belongs to what is interpreted here as *T. lapsus*, and current morphological knowledge is insufficient to separate females (in case of greater external variation). Until further evidence is gained, the maintenance of these separate species under the two names is proposed.

Material and methods

The material used in this article is almost exclusively based on material collected by Michael Schülke with a car-net in 2015. The type specimens were examined in 2002, long before the identification of the new material. The specimens examined are deposited in the following collections:

AMNH	American Museum of Natural History, New York, USA
coll. Schülke	private collection of Michael Schülke, Berlin, Germany (now in ZMHB)
NMW	Naturhistorisches Museum Wien, Vienna, Austria
USNM	National Museum of Natural History (Smithsonian Institution), Washington D.C., USA
ZMHB	Museum für Naturkunde, Leibniz-Institut für Evolutions- und Biodiversitätsforschung [formerly: Museum für Naturkunde der Humboldt-Universität], Berlin, Germany

Measurements are defined as follows: HW = head width with eyes; TW = head width at temples; PW = maximum width of pronotum; SW = approximate width of shoulders; AW = maximum width of abdomen; HL = head length from front margin of clypeus to the beginning of neck at middle-line; EL = eye length; TL = length of temple; PL = length of pronotum in midline; SL = length of elytra from shoulder; SC = length of elytra from hind apex of scutellum; FB = forebody length (combined length of head, pronotum and elytra); BL = approximate body length. All measured from dorsal view. For descriptions and measurements a Leica MZ 12.5 stereoscopic microscope was used. For the line drawings permanent preparations were made in Euparal mounting medium on plastic cards pinned with the specimens. Preparation techniques for terminalia and genitalia are detailed in MAKRANCZY (2006). Drawings were made with a Jenalab (Carl Zeiss, Jena) compound microscope and drawing tube (camera lucida). For the colour habitus photographs a Nikon D4 camera and a Novoflex bellows were used with Mitutoyo 5/0.14 Apo ELWD lense. Resulting images are focus stacks, aligned and stacked with ZereneStacker.

Thinodromus diffusus (CASEY, 1889)

(Figs. 1–3, 7–9, 13–20)

Trogophloeus diffusus CASEY 1889: 350.
Carpelimus (*Trogophloeus*) *diffusus*: HATCH 1957: 92.
Thinodromus diffusus: HERMAN 1970: 387; 2001: 1770, MAKRANCZY 2006: 108; 2018: 96.

MATERIAL EXAMINED:

USA: Idaho: Boise Co. or Valley Co., N Boise, Boise National Forest, Crouch, Middlefork Road to Trail Creek Pass Summit, 44°11'56"N 115°55'59"W to 44°18'7"N 115°50'31"W, 950–1510 m, 2.VII.2015, leg. M. Schülke (USA15-33AK), coniferous forest, car-net (1 ♂, 2 ♀♀, coll. Schülke); Montana: Gallatin Co., Bridger Range N Bozeman, Bracket Creek Road 45°51'30.3"N 110°52'50.5"W, ca. 1780 m to 45°52'47.1"N 110°47'21.0"W, ca. 1660 m, 22.VI.2015, leg. M. Schülke (USA15-16AK), coniferous forest, extensive meadows, car-net (1 ♂, 3 ♀♀, coll. Schülke, 1 ♂, 1 ♀, NMW); Gallatin Co., 25 km S Bozeman, Storm Castle Road from Gallatin River to 45°25'26"N 111°7'21"W, 1640–1880 m, 20.VI.2015, leg. M. Schülke (USA15-14AK), mixed coniferous forest, car-net (2 ♀♀, coll. Schülke); South Dakota: Pennington Co., Black Hills National Forest, W Hill City, Ditch Creek Road and Deerfield Lake, 44°0'22"N 103°48'01"W – 43°55'2"N 103°49'40"W, 1870–2010 m, 26.VI.2015, leg. M. Schülke (USA15-24AK), coniferous forest and meadows, car-net (1 ♂, coll. Schülke).

REDESCRIPTION: Measurements (in mm, n = 10): HW = 0.45 (0.43–0.48); TW = 0.44 (0.42–0.47); PW = 0.51 (0.48–0.55); SW = 0.62 (0.58–0.68); AW = 0.65 (0.61–0.68); HL = 0.33 (0.32–0.36); EL = 0.14 (0.13–0.15); TL = 0.09 (0.085–0.10); PL = 0.39 (0.36–0.41); SL = 0.67 (0.61–0.73); SC = 0.64 (0.58–0.70); FB = 1.43 (1.32–1.53); BL = 2.62 (2.43–2.81). Habitus as in Fig. 1 (male). Lustre and colour: Body with greasy lustre, without major difference between body parts. Head and pronotum with elevated parts shinier because of smoothening microsculpture, on elytra punctation interspaces small, abdomen with extremely fine microsculpture. Head, pronotum and abdomen blackish dark brown, elytra dark brown with reddish tint, occasionally even lighter. Legs and mouthparts dark brown, antennae more blackish. Shape and

sculpture: Both head and pronotum (Fig. 7) slightly transverse, eyes moderately large, head with slightly bulging, unevenly rounded temples (anteriorly less curved), slightly shorter than length of the eye. Clypeus delimited by fine, shallow and often vanishing impressed line (epistomal sulcus), anteriorly truncate, moderately projecting forward, corners narrowly rounded, vertex impressed besides (around) supraantennal tubercles and with insignificant impression mid-vertex, neck delimited by constriction (shallow groove). Antennae (Fig. 8) with antennomeres transverse, antennomeres 5–6 about as broad as long (antennomere 6 in males slightly larger, as in Fig. 3), antennomeres 9–10 1.0–1.1 × as broad as long. Pronotum with sharp anterior corners, lateral margin slightly concave behind it, more strongly rounded at anterior 1/3 length, posteriorly rather straight (convergent), posterior corners very broadly rounded, inconspicuous. Lateral margin slightly serrate. Anterior and posterior margins truncate or very slightly arcuate. Pronotal midline elevated in posterior 3/5 length and impressed on each side of it and with a pair of elevations near posterior corners. Elytra (Fig. 9) almost parallel-sided (very slightly dilating), hind margin oblique and insignificantly curved with very thin marginal bead and membranous lobe near broadly rounded outer corners. Behind scutellum on both sides of suture with small oval impressions shallowly extending posteriorly. Abdominal sides slightly arcuate, apex of abdominal tergite VII with evenly thin palisade fringe. Males with a pair of tiny tubercles (Fig. 2) at about 2/3 length of tergite VII separated by about 1/5 of tergite width. Punctation and microsculpture: Head medially rather shiny with unevenly sized, umbilicate punctures with ample interspaces, punctation denser towards sides. Clypeus finely punctate in the same fashion as rest of head, with indistinct microsculpture. Vertex with loose punctation but more dense in depressions besides supraantennal tubercles, finer near border of neck. Neck with slightly transverse coriaceous microsculpture almost lacking punctation. Pronotum predominantly shiny with scattered (unevenly distributed) characteristic umbilicate punctation, in few places with slightly transverse coriaceous microsculpture, middle of pronotal sides slightly depressed and strongly microsculptured with denser punctation. Elytra with slight surface ruggedness or unevenness obscuring regular (evenly spaced) shallow umbilicate punctation, average interspaces about half of puncture diameters. Abdomen finely to minutely punctate with normal punctures denser and deeper near bases and with transverse coriaceous microsculpture except apex of tergite VII. Pubescence: Setation sparse, short and depressed on forebody, but on elytra more regular (equally spaced), on abdomen same density as on elytra but longer, especially near apices of tergites (directed postero-mediad). Direction of setae on most of elytral disc postero-laterad, at apex lateral, at suture and near sides mostly posteriad.

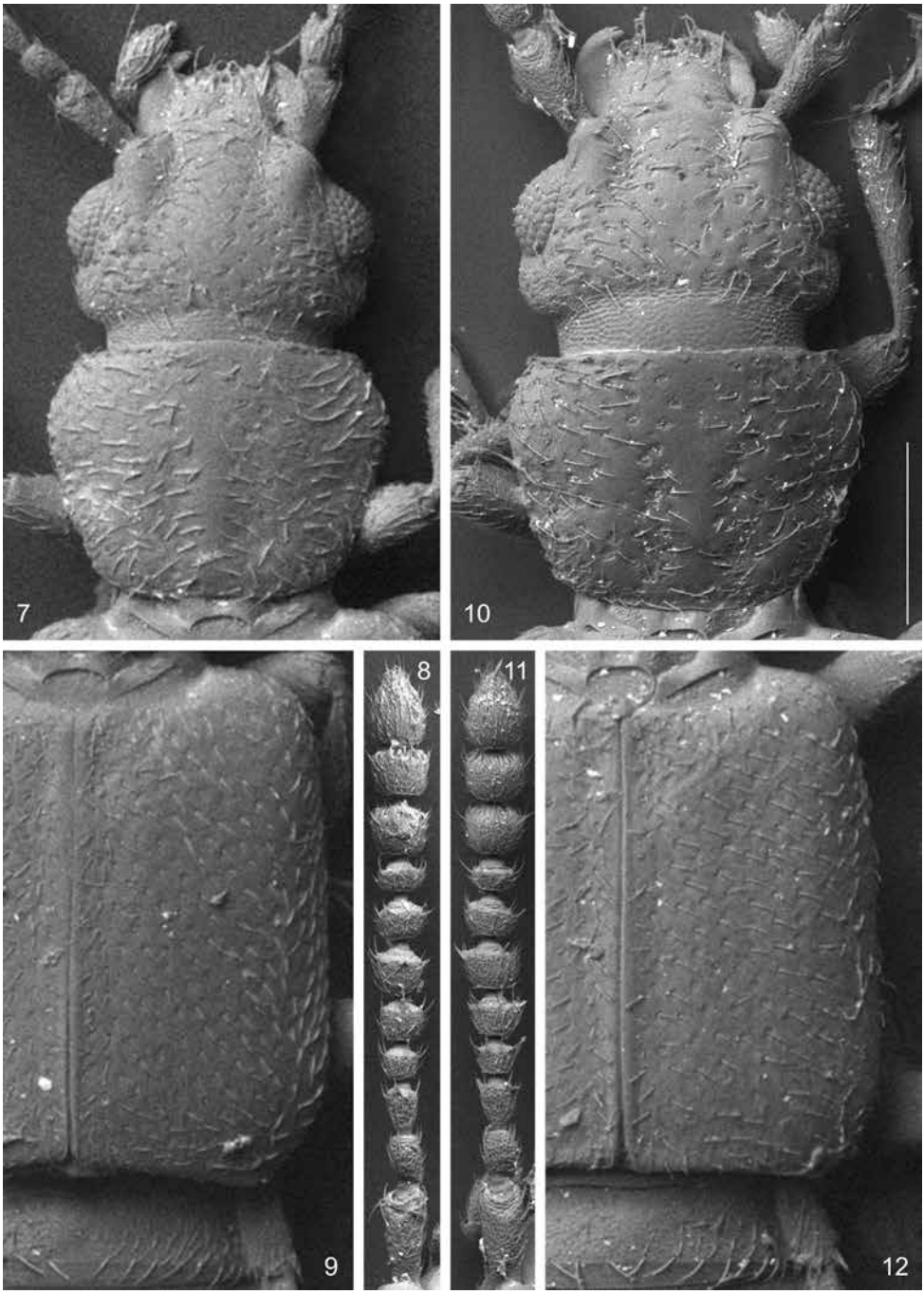
Terminalia and genitalia: Male sternite VII as in Fig. 13, sternite VIII as in Fig. 14, sternite IX as in Fig. 15, tergite X as in Fig. 16, aedeagus in frontal view as in Fig. 17, median lobe and paramere in lateral view as in Figs. 18–19, spermatheca as in Fig. 20.

DISTRIBUTION AND BIONOMICS: HATCH (1957) regarded this species to be common, recording it (besides California) from British Columbia (Canada), Idaho, Washington and Oregon (USA). Here, its distribution is expanded to Montana and South Dakota.

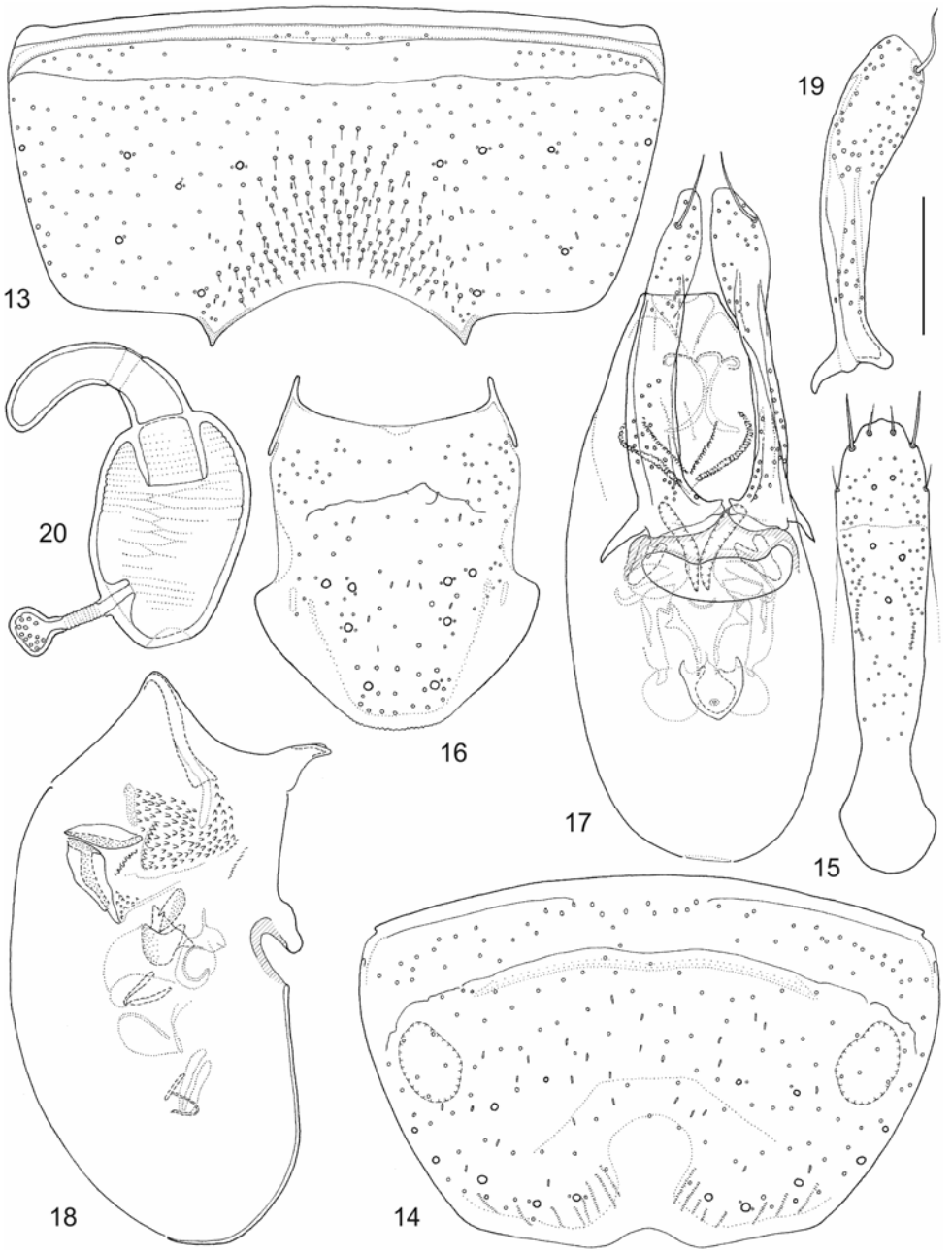
COMMENT: A rather ubiquitous species with a great range of variation, especially in colour. Existence of cryptic species cannot be excluded, and therefore, its identity may require re-examination in the future.

The taxon presented here is regarded as conspecific with *T. diffusus* treated in MAKRANCZY (2006), however, improved illustrations are provided here because of the presence of well-preserved fresh material.

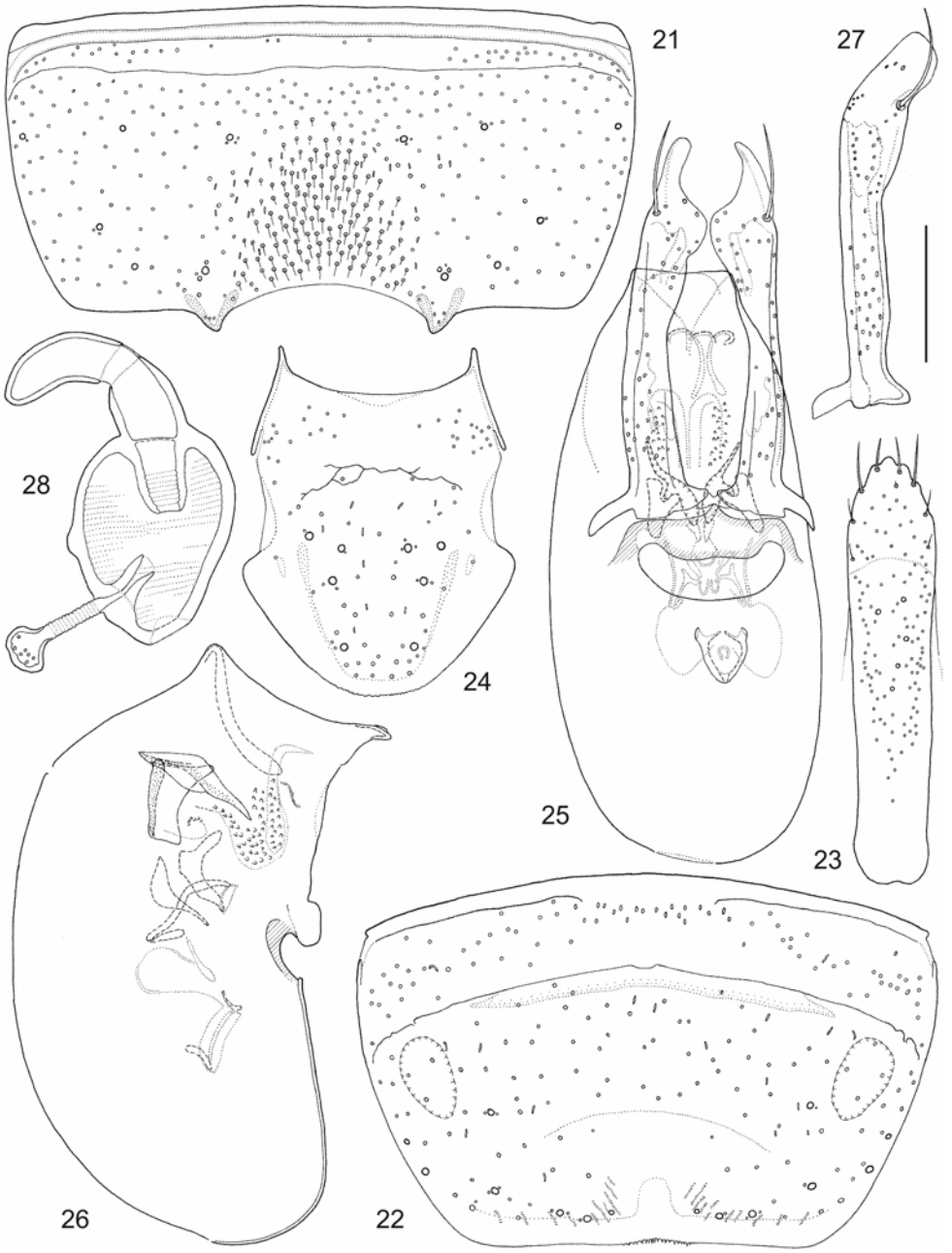
Figs. 1–6: *Thinodromus diffusus* ♂ (1–3), *T. lapsus* ♂ (4–6): 1, 4) habitus; 2, 5) tergite VII, dorsal view, SEM; 3, 6) antennomeres 3–8, SEM. Scale bar = 0.25 mm (2, 5), 0.28 mm (3, 6).



Figs. 7–12: SEM of *Thinodromus diffusus* ♂ (7–9), *T. lapsus* ♂ (10–12): 7, 10) head and pronotum; 8, 11) antenna; 9, 12) elytron. Scale bar = 0.25 mm (8, 10–11), 0.28 mm (7, 9, 12).



Figs. 13–20: *Thinodromus diffusus*: 13) male sternite VII; 14) male sternite VIII; 15) male sternite IX; 16) male tergite X; 17) aedeagus, frontal view; 18) aedeagus, median lobe, lateral view; 19) paramere, lateral view; 20) spermatheca. Scale bar = 0.06 mm (20), 0.10 mm (15–19), 0.115 mm (14), 0.135 mm (13).



Figs. 21–28: *Thinodromus lapsus*: 21) male sternite VII; 22) male sternite VIII; 23) male sternite IX; 24) male tergite X; 25) aedeagus, frontal view; 26) aedeagus, median lobe, lateral view; 27) paramere, lateral view; 28) spermatheca. Scale bar = 0.05 mm (28), 0.10 mm (23–27), 0.125 mm (22), 0.15 mm (21).

Thinodromus lapsus (CASEY, 1889)

(Figs. 4–6, 10–12, 21–28)

Trogophloeus lapsus CASEY 1889: 350.
Thinodromus lapsus: HERMAN 1970: 387; 2001: 1770; MAKRANCZY 2018: 96.

MATERIAL EXAMINED:

USA: Montana: Flathead Co., 25 km W Kalispell, near Bitterroot Lake, 48°1–6'N 114°40–42'W, 1200 m, 16.VI.2015, leg. M. Schülke (USA15-06AK), coniferous forest and settlements, lake border, car-net (1 ♂, coll. Schülke, 1 ♂, NMW); Gallatin Co., 25 km S Bozeman, Storm Castle Road from Gallatin River to 45°25'26"N 111°7'21"W, ca. 1640–1880 m, 20.VI.2015, leg. M. Schülke (USA15-14AK), mixed coniferous forest, car-net (1 ♂, 2 ♀♀, coll. Schülke, 1 ♀, NMW); Gallatin Co., Bridger range N Bozeman, Bracket Creek Road, 45°51'30.3"N 110°52'50.5"W – 45°52'47.1"N 110°47'21.0"W, ca. 1660–1780 m, 22.VI.2015, leg. M. Schülke (USA15-16AK), coniferous forest, extensive meadows, car-net (1 ♂, 1 ♀, coll. Schülke); Arizona: Cochise Co., Chiricahua Mts., 4.5 miles SW Portal, Hidden Terrace, 5400 ft. [31°53'N 109°12'W], 11.–15.IX.1982, leg. M.A. Cazier [probably at light] (1 ♂, AMNH).

REDESCRIPTION: Measurements (in mm, n = 9): HW = 0.45 (0.43–0.48); TW = 0.44 (0.42–0.46); PW = 0.48 (0.45–0.50); SW = 0.58 (0.53–0.61); AW = 0.60 (0.56–0.63); HL = 0.34 (0.32–0.35); EL = 0.14 (0.135–0.150); TL = 0.09 (0.08–0.10); PL = 0.38 (0.36–0.40); SL = 0.65 (0.62–0.68); SC = 0.62 (0.59–0.65); FB = 1.39 (1.33–1.46); BL = 2.61 (2.42–2.77). Habitus as in Fig. 4 (male). Lustre and colour: Body moderately lustrous for elevated shinier parts on head and pronotum and obscured microsculpture on larger elytral puncture interspaces, abdomen more dull because of slightly stronger microsculpture. Head and abdomen blackish dark brown, pronotum reddish dark brown, elytra medium brown with orange tint. Legs and mouthparts medium to dark brown, antennae dark brown with base occasionally slightly lighter. Shape and sculpture: Both head and pronotum (Fig. 10) slightly transverse, eyes moderately large, head with slightly bulging, almost evenly rounded temples, length significantly less than length of the eye. Clypeus delimited by fine shallow and often vanishing impressed line (epistomal sulcus), anteriorly truncate, moderately projecting forward, corners narrowly rounded, vertex impressed besides supraantennal tubercles and with small impression on mid-vertex, neck delimited by constriction (shallow but not fine groove). Antennae (Fig. 11) with antennomeres slightly transverse, antennomeres 5–6 1.0–1.1 × as broad as long (antennomere 6 in males significantly larger, see Fig. 6), antennomeres 9–10 1.05–1.15 × as broad as long. Pronotum with sharp anterior corners, lateral margin slightly concave behind it, more strongly rounded at anterior 1/3, posteriorly straight (convergent) or even slightly concave behind widest point, posterior corners broadly rounded, less conspicuous. Lateral margin slightly serrate. Anterior margin truncate, posterior margin very slightly arched but minutely concave in middle. Pronotal midline slightly elevated in posterior half and impressed on each side of it and with a pair of elevations near posterior corners. Elytra (Fig. 12) almost parallel-sided (very slightly dilating), hind margin oblique and straight or even gently concave with very thin marginal bead and insignificant membranous lobe near unevenly rounded outer corners. Behind scutellum on both sides of suture with elongate oval impressions shallowly extending posteriorly. Abdomen rather parallel-sided with slight basal constriction, apex of abdominal tergite VII with evenly thin palisade fringe. Males with a pair of conspicuous tubercles (Fig. 5) at about 2/3 length of tergite VII, separated by about 1/5 of tergite width. Punctation and microsculpture: Head rather shiny with larger umbilicate punctures and significant interspaces. Clypeus rather finely punctate and with shallow coriaceous microsculpture in the same fashion as on the rest of the head, with indistinct microsculpture. Vertex in middle with large punctures with wide interspaces and only traces of microsculpture, but denser towards sides and in depressions besides supraantennal tubercles, finer near border of neck. Neck with slightly transverse coriaceous microsculpture almost lacking punctation. Pronotum predominantly shiny with scattered (unevenly distributed) characteristic umbilicate punctation, at few places with slightly transverse coriaceous microsculpture, middle of pronotal sides slightly depressed and strongly microsculptured with denser punctation. Elytra with traces

of microsculpture or slight surface unevenness (stronger towards apex) and rather regular (more evenly spaced) umbilicate punctation, average interspaces about the same as puncture diameters. Abdomen minutely punctate with normal punctures (denser near bases) and with fine isodiametric coriaceous microsculpture, occasionally smoothening medially and at apex of tergite VII. Pubescence: Setation sparse and short on forebody, but on elytra more regular (equally spaced), on abdomen same density as on elytra but longer, especially near apices of tergites, directed postero-mediad. Direction of setae on most of elytral disc semi-laterad, at apex laterad, only at suture posteriad.

Terminalia and genitalia: Male sternite VII as in Fig. 21, sternite VIII as in Fig. 22, sternite IX as in Fig. 23, tergite X as in Fig. 24, aedeagus in frontal view as in Fig. 25, median lobe and paramere in lateral view as in Figs. 26–27, spermatheca as in Fig. 28.

DISTRIBUTION AND BIONOMICS: This species was not recorded since its description. This is the first demonstration of the existence of at least one sibling species, but its conspecificity with the holotype cannot be guaranteed, as the holotype is a female and lacks the most distinctive features.

Pending a confirmatory result, the present account expands its range from the eastern border of California to Montana and Arizona.

COMMENT: This species is distinguishable from *T. diffusus* by the generally sparser punctation, shinier head and pronotum and contrastingly lighter elytra, besides numerous genitalic traits. It is also remarkable that in both of these species antennomere 6 is larger in males.

More work is necessary to properly recognize this species and determine, whether this is the only cryptic species within the rather variable *T. diffusus*.

Acknowledgements

Thanks are due to Michael Schülke (Berlin, Germany) for the loan of material and Harald Schillhammer (NMW) for the colour photographs.

My visit to the USNM in 2002 was made possible by an Ernst Mayr Travel Grant (from the Museum of Comparative Zoology, Harvard University, Cambridge).

Volker Assing (Hannover, Germany) and Petr Baňař (Brno, Czechia) reviewed a previous version of this manuscript, Lee Herman (New York, USA) also improved the text with his comments.

References

CASEY, T.L. 1889: A preliminary monograph of the North American species of *Trogophloeus*. – Annals of the New York Academy of Sciences 4 [1887–1889]: 322–383.

HATCH, M.H. 1957: The beetles of the Pacific Northwest. Part II: Staphyliniformia. – Seattle (USA): University of Washington Press, ix + 384 pp., 37 pls.

HERMAN, L.H. 1970: Phylogeny and reclassification of the genera of the rove-beetle subfamily Oxytelinae of the world (Coleoptera, Staphylinidae). – Bulletin of the American Museum of Natural History 142 (5): 343−454.

HERMAN, L.H. 2001: Catalog of the Staphylinidae (Insecta: Coleoptera). 1758 to the end of the second Millennium. – Bulletin of the American Museum of Natural History 265: 1–4218.

MAKRANCZY, Gy. 2006: Systematics and phylogenetic relationships of the genera in the *Carpelimus* group (Coleoptera: Staphylinidae: Oxytelinae). – Annales historico-naturales Musei Nationalis Hungarici 98: 29−119.

MAKRANCZY, Gy. 2018: Generic reassignments of New World species in the *Carpelimus* group of genera (Coleoptera: Staphylinidae: Oxytelinae). – Koleopterologische Rundschau 88: 75–102.

Dr. György MAKRANCZY
Hungarian Natural History Museum, Baross u. 13, *H – 1088 Budapest*, *Hungary* (makranczy.gyorgy@nhmus.hu)