

# Discovery of a new species of the genus *Triarthron* Märkel, 1840 (Coleoptera, Leiodidae) with a key to Japanese species of the tribe Sogdini

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## Abstract

In the genus *Triarthron* (Coleoptera, Leiodidae, Leiodinae), only two species are known to occur in Palearctic and Nearctic regions. In this paper, a new species in Japan, *Triarthron itoi* Hoshina, **sp. nov.**, is described. This brings the number of species in the genus to three. A key to the Japanese species of the tribe Sogdini is given.

## Keywords

Japan, Leiodinae, round fungus beetles, taxonomy, *Triarthron itoi* sp. nov., *Triarthron maerkelii*

## Introduction

The genus *Triarthron* belongs to the tribe Sogdini of the subfamily Leiodinae in the family Leiodidae (Newton 1998; Perreau 2004, 2015) and was established based on a European species, *T. maerkelii* by Märkel (1840). In the Palearctic region, *T. punctipennis* Reitter, 1901 was described by Reitter (1901) but transferred to the genus *Deltocnemis* J. Sahlberg, 1886 by Reitter (1913). Finally, *D. punctipennis* (Reitter) was synonymized with *Stereus* (*Deltocnemis*) *hamatus* J. Sahlberg, 1886 (Perkovsky 1991).

Later, Israelson (1978) added one species, *T. thurepalmi* Israelson, 1978 to a member of *Triarthron* from the Canary Islands, but this species was also transferred to the genus *Stereus* Wollaston, by Daffner (1983). It was cleared that *Stereus* Wollaston was a homonym of *Stereus* Mannerheim, 1846 (Curculionidae) (Bouchard et al. 2011), and the species was later transferred to the genus *Pseudotriarthron* Normand, 1938 by Sáez Bolaño et al. (2013).

In the Nearctic region, Horn (1868) described *Triarthron lecontei* Horn, 1868 from California. Later, Schaufuss (1882) added one Californian species, *T. cedonulli* Schaufuss, 1822, to the fauna of *Triarthron*, but Horn (1883) synonymized that species with *T. lecontei*. Furthermore, Horn (1883) described a new species, *T. pennsylvanicum* Horn, 1883 from Pennsylvania. However, that species was synonymized with *T. lecontei* Horn, 1868 by Peck and Cook (2009). Thus, *Triarthron* is a small genus, and is composed of only two species, *T. maerkelii* and *T. lecontei*, worldwide.

Hisamatsu (1985) recorded *Triarthron maerkelii* Märkel, 1840 for the first time in Japan. Recently, I had an opportunity to examine one unidentified Japanese *Triarthron* specimen. My careful examination showed that the specimen is a new member of the genus. I describe the new species under the name *Triarthron itoi* Hoshina sp. nov., as a third member of the genus.

In Japan, five species in four genera of the tribe Sogdini have been recorded: *Triarthron*, *Hydnobius* Schmidt, 1841; *Hinomoto* Hoshina, 2002; and *Sogda* Lopatin, 1961 (Hisamatsu 1985; Hoshina 2002, 2010, 2012, 2014, 2015; Hoshina and Sunada 2003). *Triarthron itoi* Hoshina, sp. nov. is a sixth Japanese species of Sogdini. Below, I provide a key to the Japanese species of Sogdini.

Materials and methods

All specimens used in this study were deposited in the following collections:

- EUMJ      Ehime University, Matsuyama, Japan
- FU        University of Fukui, Fukui, Japan
- OSAKA    Osaka Museum of Natural History, Osaka, Japan

The methods are the same as those described in Hoshina (2012).

Key to Japanese species of the Sogdini tribe

- 1        Pronotum almost as long as wide .....2
- Pronotum clearly wider than long (Fig. 1) .....3
- 2        Median lobe of the aedeagus is relatively slender and weakly curved in lateral view ..... *Hinomoto nibonensis* Hoshina
- Median lobe of the aedeagus is relatively thick and almost straight in lateral view ..... *Hinomoto bungensis* Hoshina

- 3 Antennae forming a club on antennomeres 9–11 (Fig. 3) ..... 4  
 – Antennae forming a club on antennomeres 7–11 ..... 5  
 4 Body length 4.8 mm; mesofemur with relatively large teeth at dorsal lamina  
 of posterior margin (Fig. 4); metafemur strongly expanded anteriorly at about  
 half of antero-apical margin (Fig. 5); median lobe of aedeagus weakly and  
 simply curved at lateral margins in dorsal view (Fig. 8) .....  
 ..... *Triarthron itoi* Hoshina, sp. nov.  
 – Body length 2.5–3.8 mm; mesofemur with teeth less-visible because of being  
 hidden by ventral side of mesofemur (Fig. 6); metafemur relatively weakly  
 expanded anteriorly at about half of antero-apical margin (Fig. 7); median  
 lobe sharply narrowed from about apical 2/5 towards apex (Fig. 10) .....  
 ..... *Triarthron maerkelii* Märkel.  
 5 Body cylindrical in general; apex of right mandible bidentate .....  
 ..... *Hydnobius akitsuensis* Hoshina  
 – Body long oval in general; apices of both mandibles simply pointed .....  
 ..... *Sogda badai* Hoshina

**Coloration.** Dorsum shining and almost concolorous, brown (Fig. 1); clypeus and labrum light brown; antennae brown and terminal three antennomeres slightly lighter



**Figure 1.** Habitat of *Triarthron itoi* Hoshina, sp. nov. Scale bar: 1 mm.

than others; legs brown in general, but all trochanters and about basal 2/5 of metafemora blackish brown; mesoventrite, metaventrite, and abdominal ventrites light brown.

**Body** approximately 2.2 times as long as wide.

**Head** almost smooth, minutely, and densely punctate (Fig. 2), and bearing a few short and very fine setae near each eye and a few long and fine setae near each lateral-



basal corner of the clypeus; both mandibles sharply curved inwardly at about apical 1/4 and lacking large teeth at internal margins; antennomeres 1–3 longer than wide; antennomeres 4 and 11 about as long as wide; remaining antennomeres wider than long (Fig. 3).

**Pronotum** almost smooth and glabrous, widest at about basal 2/5 of lateral margins, minutely and densely punctate as head (Fig. 2), and with a transverse fine groove along the basal margin, which is interrupted at the central part (Fig. 2).

**Scutellum** almost smooth and distinctly punctate (Fig. 2).

**Elytra** almost smooth and glabrous except for very sparse and fine setae along lateral margins, widest at about basal 1/3 of lateral margins (Fig. 2); each elytron bearing nine rows of punctures and ninth row present along lateral-downside margins and invisible in dorsal view (Fig. 2); punctures comprising nine rows of punctures distinct and larger than those of head and pronotum (Fig. 2); punctures between rows of punctures dense and minute (Fig. 2).

**Hind wings** fully developed.

**Mesoventrite** weakly microreticulate and almost glabrous; metaventrite and abdominal ventrites distinctly microreticulate, and densely and finely pubescent.

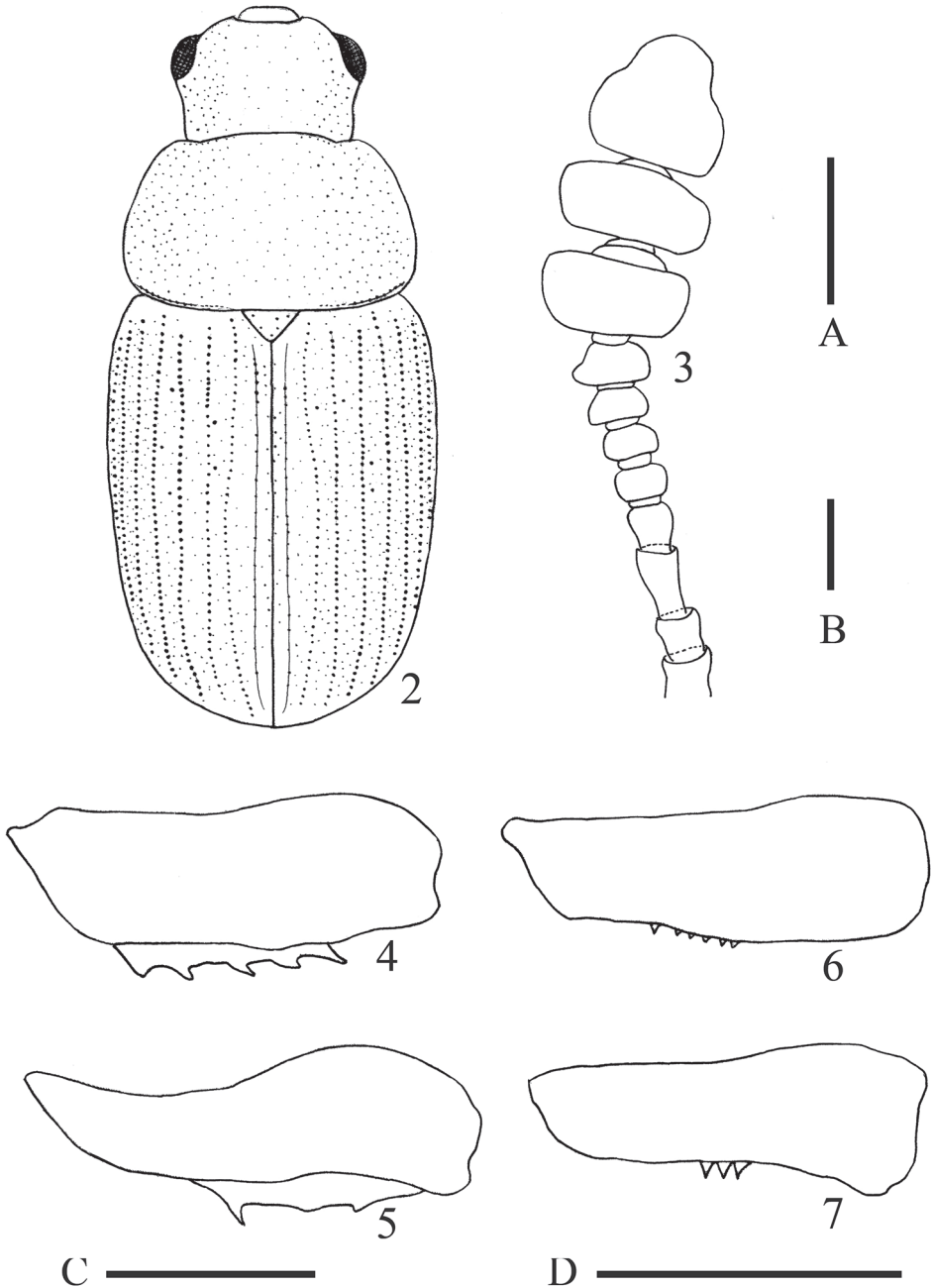
**Legs** with many small spines as other species of the genus *Triarthron*; mesofemur approximately 2.8 times as wide as long, weakly expanded anteriorly at about half of antero-apical margin, and bearing five small teeth at dorsal lamina of posterior margin (Fig. 4); mesotibia weakly curved inwardly; metafemur approximately 2.8 times as wide as long, strongly expanded anteriorly at about half of antero-apical margin, and bearing a relatively long tooth and two tiny ones at dorsal lamina of posterior margin (Fig. 5); metatibia almost straight.

**Aedeagus** slender in general (Figs 8, 9); median lobe weakly and simply curved at lateral margins, round at apex in dorsal view (Fig. 8) and almost straight in lateral view (Fig. 9); both parameres almost symmetrical and round at apex (Fig. 8) and almost straight in lateral view (Fig. 9); each paramere bearing three apical setae (Figs 8, 9).

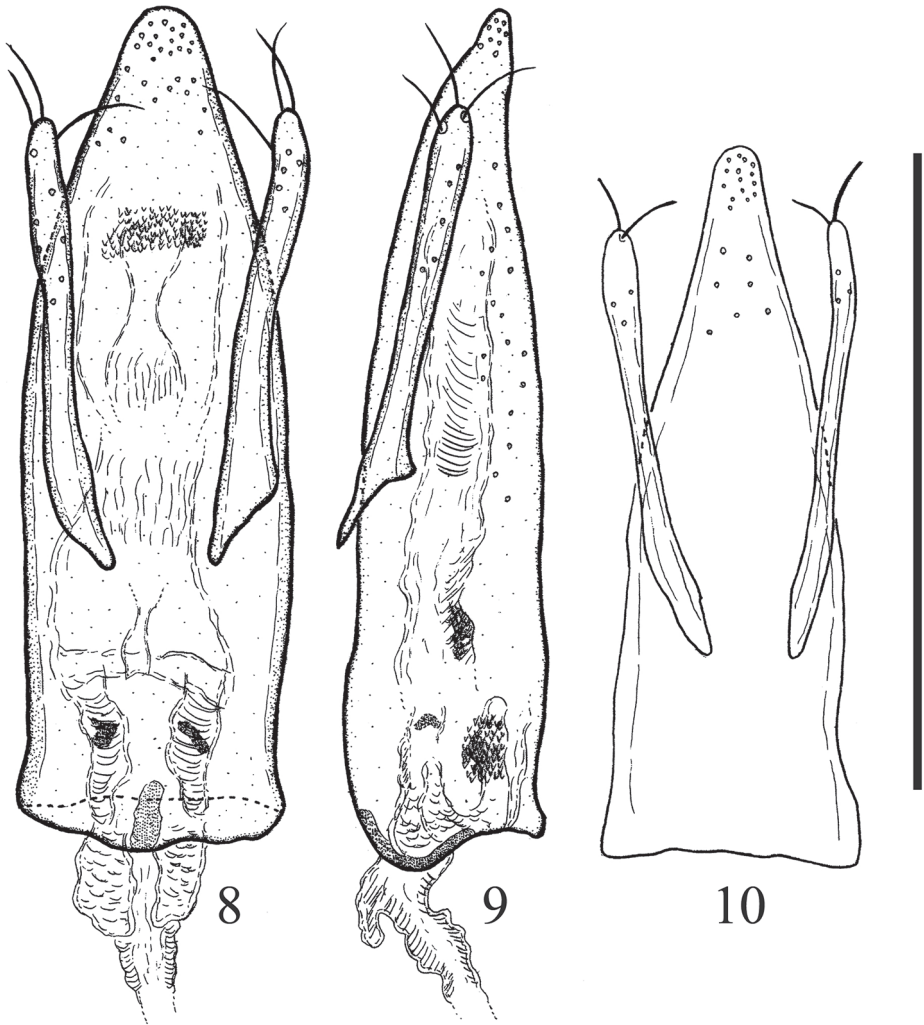
**Etymology.** The specific name is dedicated to Mr. Fukuo Itô, the collector of the holotype.

**Distribution.** Japan: Honshu (Nara Prefecture).

**Differential diagnosis.** Collecting the tribe Sogdini is generally not easy in Japan and identified Japanese specimens of the tribe are very small in quantity. *Triarthron itoi* Hoshina, sp. nov. is described based on only one specimen; therefore, the degree of individual variation cannot be determined in this species. However, I found some morphological features on that specimen that are clearly different from two known species of *Triarthron*, and recognize it as a new member of the genus. *Triarthron itoi* sp. nov. can be distinguished from *T. maerkelii* Märkel, 1840 by the following features: it has a large body whose length is 4.8 mm, mesofemur with relatively large teeth at the dorsal lamina of the posterior margin (Fig. 4), metafemur strongly expanded anteriorly at about half of the antero-apical margin (Fig. 5), and median lobe of aedeagus weakly and simply curved at lateral margins in dorsal view (Fig. 8). In contrast, *T. maerkelii* differs in the following ways: it has a relatively small body whose length is 2.5–3.8 mm



**Figures 2–7.** *Triarthron itoi* Hoshina, sp. nov. (2–5). **2** Body **3** right antennomere, dorsal view **4** left mesofemur, ventral view **5** left metafemur, ventral view. *T. maerkelii* Märkel (**6**, **7**). **6** Left mesofemur, ventral view **7** left metafemur, ventral view. Scale bar: A: 1 mm (**2**), B: 0.2 mm (**3**), C, D: 0.5 mm (**4–7**).



**Figures 8–10.** *Triarthron itoi* Hoshina sp. nov. (**8, 9**). **8** Aedeagus, dorsal view **9** ditto, lateral view. *T. maerkelii* Märkel (**10**) aedeagus, dorsal view. Scale bar: 0.5 mm (**8–10**).

(Daffner 1983), mesofemur with teeth less-visible because of being hidden by ventral side of mesofemur (Fig. 6), metafemur relatively weakly expanded anteriorly at about half of antero-apical margin (Fig. 7), and median lobe sharply narrowed from about apical  $2/5$  towards apex (Fig. 10).

Moreover, *T. itoi* sp. nov. can be separated from *T. lecontei* Horn, 1868 by having both mandibles sharply curved inwardly at about apical  $1/4$  and lacking large teeth at internal margins, and metafemur strongly expanded at the anterior margin (Fig. 5). In contrast, *T. lecontei* has both mandibles relatively weakly curved inwardly at internal

margins, right one with an elongated sub-apical tooth, and metafemur almost straight at the anterior margin (Hatch 1957; Peck and Cook 2009).

**Natural history.** Life history of *Triarthron itoi* Hoshina, sp. nov. is not known.

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## References

- Bouchard P, Bousquet Y, Davies AE, Alonso-Zarazaga MA, Lawrence JF, Lyal CHC, Newton AF, Reid CAM, Schmitt M, Ślipiński SA, Smith ABT (2011) Family-group names in Coleoptera (Insecta). Zookeys 88: 1–972. <https://doi.org/10.3897/zookeys.88.807>
- Daffner H (1983) Revision der paläarktischen Arten der Tribus Leiodini Leach (Coleoptera, Leiodidae). Folia Entomologica Hungarica 44: 9–163.
- Hatch MH (1957) The beetles of the Pacific Northwest. Part II: Staphyliniformia. University of Washington Publications in Biology 16. University of Washington Press, Seattle, Washington, 384 pp.
- Hisamatsu S (1985) Notes on some Japanese Coleoptera, I. Transactions of the Shikoku Entomological Society 17: 5–13.
- Horn GH (1868) New species of Coleoptera from the Pacific district of the United States. Transactions of the American Entomological Society 2: 129–140. <https://doi.org/10.2307/25076202>
- Horn GH (1883) Miscellaneous notes and short studies of North American Coleoptera. Transactions of the American Entomological Society 10: 269–312. <https://doi.org/10.2307/25076425>
- Hoshina H (2002) A new genus of the tribe Sogdini (Coleoptera, Leiodidae, Leiodinae) from Japan, with description of a new species. Biogeography 4: 7–12.
- Hoshina H (2010) Review of the tribes Sogdini and Leiodini (Coleoptera: Leiodidae) from Japan, I. The Memoirs of the Research and Education Center for Regional Environment, University of Fukui 17: 11–16.
- Hoshina H (2012) Review of the tribes Sogdini and Leiodini (Coleoptera: Leiodidae) from Japan and North Chishima Islands, part II. Genera *Hydnobius* and *Leiodes*. Acta Entomologica Musei Nationalis Pragae 52 (supplementum No. 1): 1–168. [https://doi.org/10.1111/j.1556-3502.2011.52701\\_s.x](https://doi.org/10.1111/j.1556-3502.2011.52701_s.x)
- Hoshina H (2014) New record of the genus *Sogda* (Coleoptera: Leiodidae) from Japan, with description of a new species. Japanese Journal of Systematic Entomology 20: 279–282.
- Hoshina H (2015) Description of a second species of the genus *Hinomoto* (Coleoptera, Leiodidae) from Japan. Elytra, New Series 5: 13–16.



- Hoshina H, Sunada T (2003) The first record of the genus *Hydnobius* (Coleoptera, Leiodidae) from Japan with description of a new species. *Japanese Journal of Systematic Entomology* 9: 107–111.
- Israelson G (1978) The Leiodini of the Canary Islands. *Vieraea* 7: 181–190.
- Märkel JCF (1840) *Triarthron Märkelii*. *Entomologische Zeitung, (Stettin)* 1: 141–142.
- Newton AFJ (1998) Phylogenetic problems, current classification and generic catalogue of world Leiodidae (including Cholevidae). In: Giachino PM, Peck SB (Eds) *Phylogeny and Evolution of Subterranean and Endogean Cholevidae (=Leiodidae Cholevinae)*. *Proceedings of a Symposium (30 August, 1996, Florence, Italy), XX International Congress of Entomology. Atti del Museo Regionale di Scienze Naturali, Torino (1988)*, 41–178.
- Peck SB, Cook J (2009) Review of the Sogdini of North and Central America (Coleoptera: Leiodidae: Leiodinae) with descriptions of fourteen new species and three new genera. *Zootaxa* 2102: 1–74. <https://doi.org/10.11646/zootaxa.2102.1.1>
- Perkovsky EE (1991) On the contents of the tribe Sogdini and systematic position of the genus *Deltocnemis* (Coleoptera, Leiodidae). *Vestnik Zoologii* 1991(4): 17–21.
- Perreau M (2004) Family Leiodidae, subfamily Leiodinae. In: Löbl I, Smetana A (Eds) *Catalogue of Palearctic Coleoptera Vol. 2*. Apollo Books. Stenstrup, 942 pp.
- Perreau M (2015) Family Leiodidae. In: Löbl I, Löbl D (Eds) *Catalogue of Palearctic Coleoptera. Hydrophiloidea-Staphylinoidea*. Revised and updated edition 2/1. Brill, Leiden. Boston, 900 pp.
- Reitter E (1901) Weitere Beiträge zur Coleopteren-Fauna des russischen Reiches. *Deutsche Entomologische Zeitschrift* 1901: 65–84.
- Reitter E (1913) Eine Serie neuer Coleopteren aus der paläarktischen Fauna. *Deutsche Entomologische Zeitschrift* 1913: 649–666.
- Sáez Bolaño JA, Blanco Villero JM, Lencina JL (2013) Descripción de una nueva especie del género *Pseudotriarthron* Normand, 1938 para la península Ibérica (Coleoptera, Leiodidae, Leiodinae). *Graellsia* 69: 7–16. <https://doi.org/10.3989/grlaesia.2013.v69.071>
- Schaufuss LW (1882) Descriptions de Coléoptères nouveaux. I. De quibusdam Coleopteris novis. *Annales de la Société entomologique de France* 6: 43–45.