

Two new species of the genus *Brachinus* WEBER, 1801 (Coleoptera: Carabidae: Brachinini) from southern Iran

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Abstract

Two new species of bombardier beetles (Brachinini) from southern Iran, *Brachinus sanchi* sp.n. and *Brachinus mansorii* sp.n., are described and illustrated. The new species form a new species group that cannot be assigned to any subgenus. They are compared with some similar species.

Key words: Carabidae, *Brachinus*, new species, Iran.

Zusammenfassung

Zwei neue Bombardierkäferarten (Brachinini) aus dem südlichen Iran, *Brachinus sanchi* sp.n. und *Brachinus mansorii* sp.n. werden beschrieben und abgebildet. Die neuen Arten bilden eine bisher unbekannte Artengruppe, die sich keiner Untergattung zuordnen lässt. Sie werden mit einigen ähnlichen Arten verglichen.

Introduction

The species of the genus *Brachinus* WEBER, 1801 are known as bombardier beetles, because of their peculiar defensive system. Like the other members of the subfamily, their larvae are ectoparasites and their adult body size depends on the size of their hosts (ERWIN 1970).

Brachinus species are widely distributed in all zoogeographical regions except the mainland of Australia (HABU 1967, ERWIN 1970). They can be identified by truncated elytra and eight externally visible abdominal sterna in males, seven in females.

During the last decades, several species of the genus *Brachinus* from the southeastern Palearctic and from the Oriental Realms were described (KIRSCHENHOFER 1994, 1996, 2010, 2011a, b, HRDLÍČKA 2009a, b, GAO & TIAN 2011), but for a long time no new species has been described from the Middle East, and just 27 species of the genus *Brachinus* are known in Iran (AZADBAKSH & NOZARI 2015).

During several expeditions of the first author in southern Iran during 2015 to 2017, two unknown species of the genus *Brachinus* were discovered in the provinces of Hormozgan, Fars, and Sistan va Baluchestan.

Material and methods

The studied material is deposited in the following collections:

ZMUT Zoology Museum of Tehran University, Tehran, Iran

SAC Private collection of Saeed Azadbakhsh, Bandar Abbas, Iran

RMCA Musée Royal de l'Afrique Centrale, Tervuren, Belgium

Acronyms used for morphometry:

- BL Body length measured from apex of clypeus to apex of elytra
BW Maximum body width, measured across elytra
PL Pronotum length, measured along midline
PW Maximum width of pronotum
EL Elytral length, measured along suture

Taxonomy

Brachinus sanchi sp.n. (Figs. 1, 5, 12)

Type material: Holotype (male, ZMUT): Iran, Fars Province, Shiraz region, 14.IV.2016, 1535 m a.s.l., leg. S. Azadbakhsh. Paratypes (all in SAc): 1 female, same data as holotype; 1 female, Iran, Hormozgan province, Bandar Abbas env., 21.III.2015, leg. S. Azadbakhsh; 1 female, same locality and collector, 30.III.2015; 1 female, Iran, Sistan va Baluchetan province, Chabahar env., 10.IV.2015, leg. S. Azadbakhsh; 1 male, 1 female, Iran, Hormozgan province, Ahmadi env., 4.IV.2017, leg. S. Azadbakhsh.

Description: Measurements: BL 9.4–10.0 mm (holotype: 9.4 mm), BW 4.6–4.9 mm (holotype: 4.6 mm), PW 1.70–1.80 mm (holotype: 1.70 mm), PL 1.63–1.73 mm (holotype: 1.63 mm), EL 5.97–6.35 mm (holotype: 5.97 mm).

Colour: Head, pronotum, antennae, labrum, mandibles, palpi and legs reddish brown. Elytra black. Abdominal sterna dark brown at middle, slightly darker laterally.

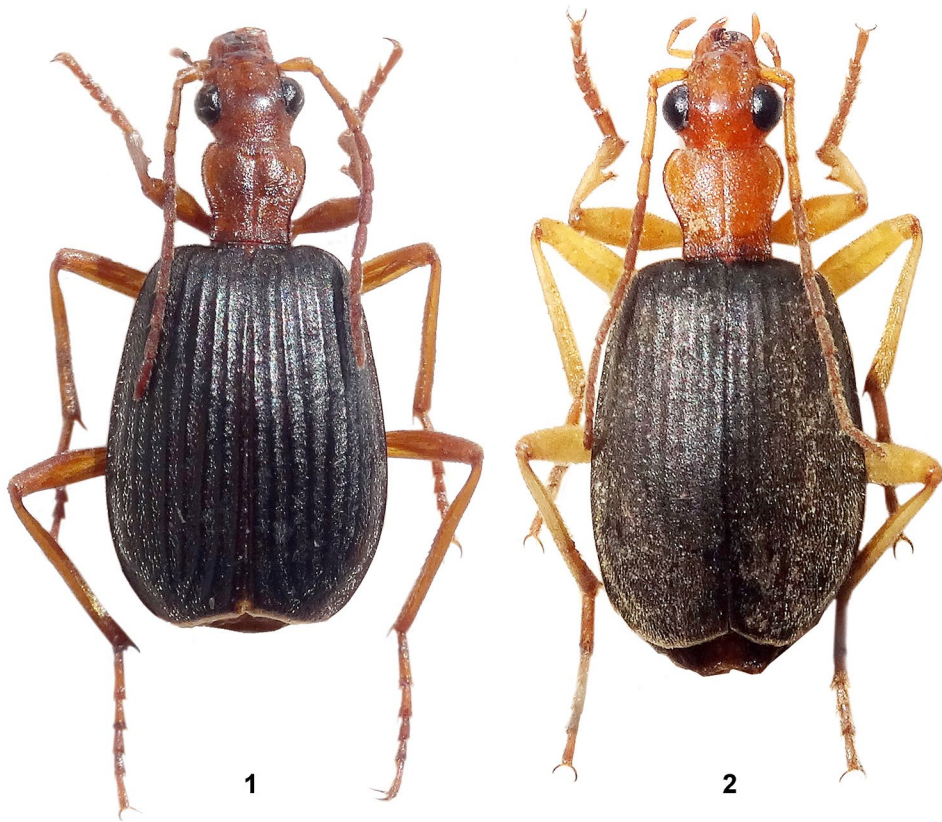
Structures: Head including eyes wider than pronotum, surface finely punctured, more or less smooth on disk; close to eyes and on sides of neck more densely punctured. Eyes convex, prominent. Clypeus bisetose, glabrous in middle. Foremargin of labrum concave, hexasetose. Mandibular scrobe plurisetose. Palpi pubescent and subcylindrical; apical maxillary and labial palpomeres not dilated apically. Segment 3 of antenna longer than segments 1 and 2 together. Mentum without middle tooth.

Pronotum cordate, 0.95× as long as wide, broadest before middle; lateral margins deeply sinuate before hind angles; hind angles nearly rectangular, slightly prominent, laterally projecting; base narrower than apex; surface with dense rugosity, with sparse and short setae mainly on sides. Proepisternum punctured and pubescent, with short setae. Metepisternum long and narrow, pubescent.

Elytra 2.83× wider than pronotum, widest behind middle; length of elytral suture shorter than length along side margins; apices widely rounded, converging to each other; apically membranous, well-marked, glabrous, without fringe of short setae on posterior margin; intervals costulate, with strong and well defined carinae, pubescent, with short bristles in rows. Abdominal sterna completely punctured and pubescent.

Male genitalia: Median lobe (Figs. 12a, b) in distal half down-curved, in dorsal view with almost rounded apex, with small, shallow incision at middle.

Differential diagnosis: *Brachinus sanchi* sp.n., is similar to *B. nigricornis* GEBLER, 1829 and *B. bayardi* DEJEAN, 1831 based on the costulate elytra intervals, but can be easily differentiated from *B. nigricornis* and all other 27 previously described species in Iran by

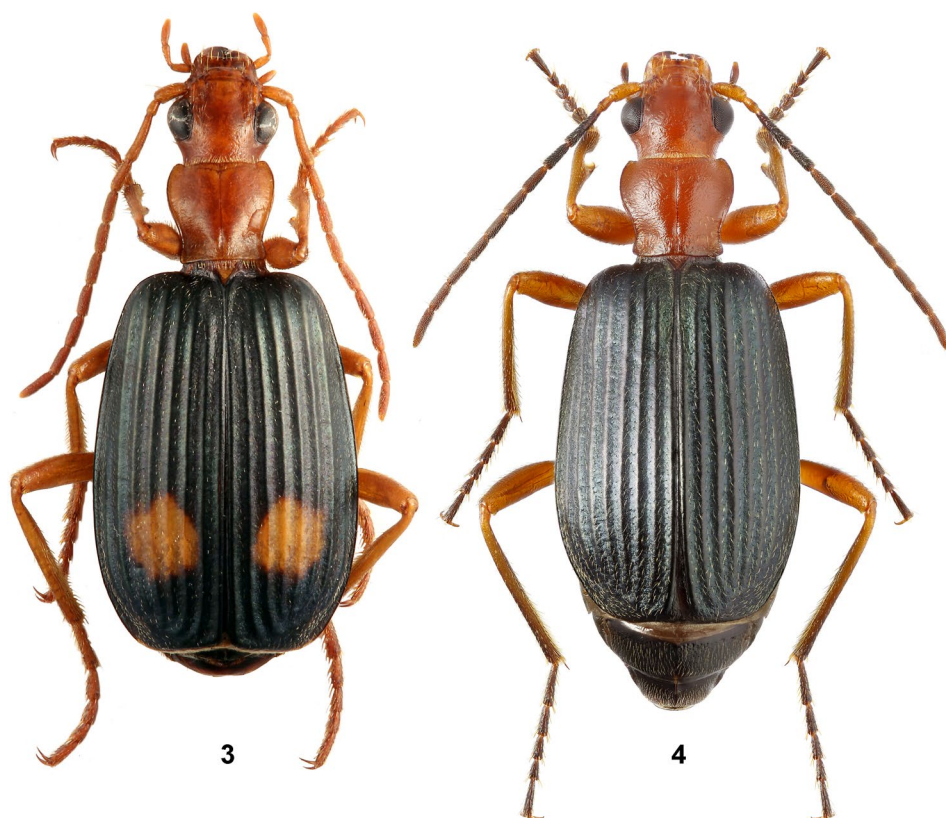


Figs. 1–2: Habitus, dorsal, of (1) *Brachinus sanchi* sp.n. and (2) *B. mansorii* sp.n.

the unique character combination of shape and structure of antennae, pronotum, elytra, and aedeagus. *Brachinus sanchi* sp.n. and *B. mansorii* sp.n. belong to a unique species group distributed in Iran and separated from all known species in Iran by having concolourous elytra in contrast to species of the subgenera *Metabrachinus* JEANNEL, 1949, *Dysbrachinus* SCHULER, 1974, *Cnecostolus* REITTER, 1919, *Aploa* HOPE, 1833, *Brachynidius* REITTER, 1919, and some species of *Brachinus* s.str. Therefore, both new species are similar to *Brachinus* (s.str.) species, but differ by lacking the row of long setae at the posterior membranous elytron margin of the latter. They are also separated from *Brachynolomus* REITTER, 1919 by the longer antennal segment 3 (longer than segments 1 and 2 combined). *Brachinus sanchi* sp.n. is somewhat similar to *B. scotti* LIEBKE, 1934 and *B. atripennis* BALLION, 1871 but can be recognized by colour and structures of pronotum, elytra, and aedeagus.

Brachinus bayardi differs from *B. sanchi* sp.n. by the following characters: Pronotum shorter, less rugose. Elytra with two rounded yellow spots (Fig. 3), apically less rounded. Median lobe of aedeagus (Fig. 13) very differently structured, apex in dorsal view rounded, without incision.

Brachinus nigricornis differs from *B. sanchi* sp.n. by the following characters: Antennal segment 3 equally long as the combination of segments 1 and 2; segments 3–11 dark brown



Figs. 3–4: Habitus, dorsal, of (3) *Brachinus bayardi* and (4) *B. nigricornis*. © A. Anichtchenko.

(not red brown). Pronotum shorter, less rugose. Elytra apically less rounded. Median lobe of aedeagus (Fig. 14) very differently structured, in dorsal view pointed.

Brachinus scotti differs from *B. sanchi* sp.n. by the following characters: Pronotum covered mainly by large punctures (not rugose with sparse and small punctures). Intervals on elytra convex, not carinate.

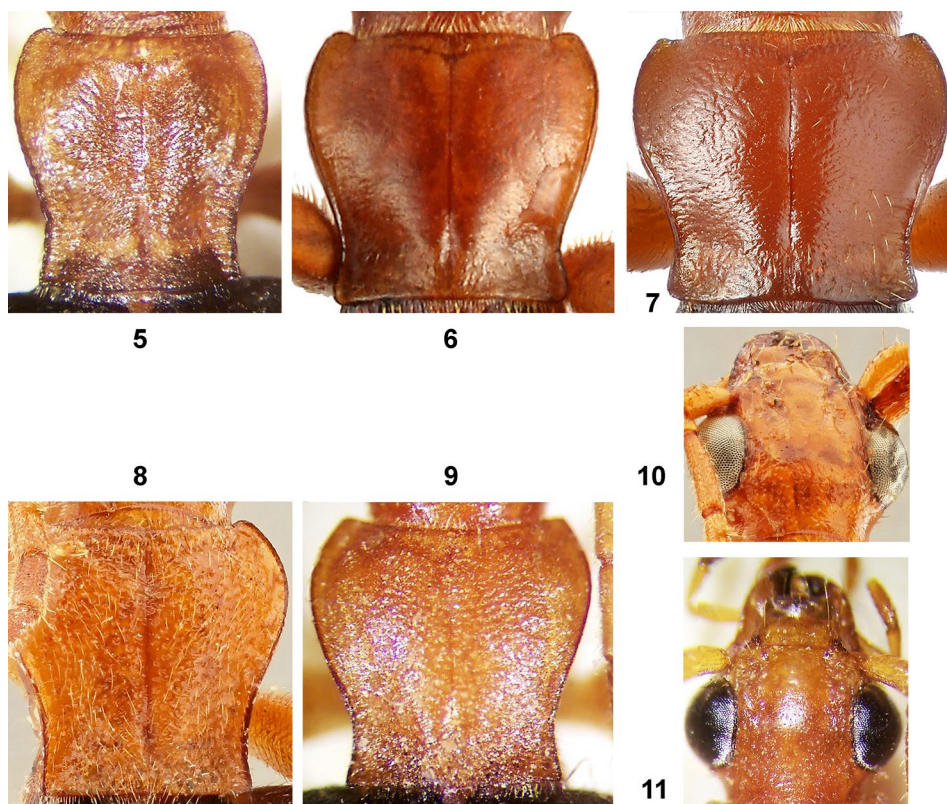
Brachinus atripennis differs from *B. sanchi* sp.n. by the following characters: Pronotum covered mainly by large punctures (not rugose with sparse and small punctures). Elytra are brownish; mesal intervals less carinate.

Distribution: Currently, the species is only known from southern Iran: Fars, Hormozgan, and Sistan va Baluchestan Provinces.

Etymology: The specific epithet *sanchi*, is given to honor the crew of the Iranian oil tanker Sanchi, who died in an accident in the East China Sea.

***Brachinus mansorii* sp.n.** (Figs. 2, 9, 11, 15)

Type material: Holotype (male, ZMUT), Iran, Hormozgan Province, Ahmadi env., 4.IV.2017, leg. S. Azadbakhsh. Paratype (SAc): 1 female, same locality and collector as holotype, 13.IV.2016.



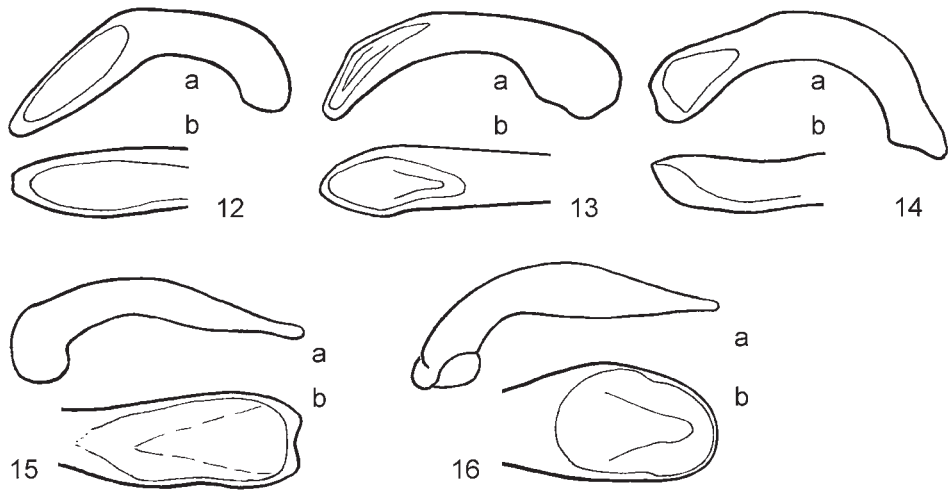
Figs. 5–11: (5–9) Pronotum, dorsal view, of (5) *Brachinus sanchi* sp.n.; (6) *B. bayardi*; (7) *B. nigricornis*; (8) *B. scotti* (specimen from RMCA); (9) *B. mansorii* sp.n. (10–11) Head, dorsal view, of (10) *B. scotti* (specimen from RMCA); (11) *B. mansorii* sp.n. © 6, 7: A. Anichtchenko.

Description: Measurements: BL 9.8–10.0 mm (holotype: 9.8 mm), BW 4.65–4.75 (holotype: 4.65 mm), PW 2.02–2.06 mm (holotype: 2.02 mm), PL 1.80–1.83 mm (holotype: 1.80 mm), EL 6.21–6.33 mm (holotype: 6.21 mm).

Colour: Head and pronotum reddish. Antennae, labrum, mandibles, palpi and legs slightly paler. Elytra black. Abdominal sterna reddish at middle and dark on sides.

Structures: Head including eyes wider than pronotum, punctured; punctures sparse and shallow on disk, but close and deep behind the eyes on neck and on frontal furrows. Eyes convex, prominent. Clypeus bisetose, glabrous in median portion. Foremargin of labrum concave, hexasetose. Mandibular scrobe plurisetose. Palpi pubescent, subcylindrical; apical maxillary and labial palpomeres not dilated apically. Segment 3 of antenna longer than segments 1 and 2 together. Mentum without middle tooth.

Pronotum cordate, 0.89× as long as wide, broadest before middle; lateral margins deeply sinuate before hind angles; anterior corners not prominent, not raised; hind angles nearly rectangular; base narrower than apex; surface covered with dense and long setae. Proepisternum punctured and pubescent. Metepisterna long and narrow, pubescent. Abdominal sterna completely punctured and pubescent.



Figs. 12–16: Median lobe of aedeagus, (a) lateral view, (b) dorsal view of apex: (12) *Brachinus sanchi* sp.n.; (13) *B. bayardi*; (14) *B. nigricornis*; (15) *B. mansorii* sp.n.; (16) *B. atripennis* (redrawn from IABLOKOFF-KHNZORIAN 1973).

Elytra 2.30× wider than pronotum, concolorous, widest behind middle, apices membranous, well marked, smooth or with a fringe of very short, hardly visible setae on posterior margin; intervals weakly convex, pubescent.

Male genitalia: Median lobe (Figs. 15a, b) weakly down-curved, almost straight in distal half, in dorsal view apex broadly rounded, with broad incision.

Differential diagnosis: *Brachinus mansorii* sp.n. belongs to the same species group as *B. sanchi* sp.n. based on concolorous elytra, long segment 3 of antenna, and posterior membranous margin of elytra without a row of long setae, but smooth or with a fringe of very short setae. It can be easily differentiated from *B. sanchi* sp.n. by shape and structure of head, pronotum, elytra, and aedeagus. *Brachinus mansorii* sp.n. is very similar in appearance to *B. scotti* LIEBKE, 1934 but can be distinguished by the structure of head and pronotum. *Brachinus mansorii* sp.n. is also similar to *B. atripennis* BALLION, 1871 (= *B. klapperichi* JEDLIČKA, 1956, = *B. adelus* IABLOKOFF-KHNZORIAN, 1973), but differs by the colour of elytra that are brownish in *B. atripennis* and black in *B. mansorii* sp.n. The similar *B. immaculicornis* DEJEAN, 1826 differs – as all other species – by the length of antennal segment 3 which is not longer than the combined length of segments 1 and 2.

Brachinus sanchi sp.n. differs from *B. mansorii* sp.n. by the following characters: Colour of head, antennae, labrum, mandibles, and palpi darker (comp. Figs. 1 and 2). Head less punctured. Pronotum narrower, rugose and covered with short and sparse setae especially on the margins. Intervals of elytra clearly costulate and covered with short and sparse setae in the rows just between intervals. Median lobe of aedeagus in distal half strongly down-curved, apex in dorsal aspect almost rounded, with a small incision.

Brachinus scotti differs from *B. mansorii* sp.n. by the following characters: Frons almost smooth, only punctured beside and behind the eyes (comp. Figs. 10 and 11). Pronotum covered with big and shallow punctures, anterior corners slightly prominent and raised, posterior corners less projecting laterally (comp. Figs. 8 and 9).

Brachinus atripennis differs from *B. mansorii* sp.n. by the following characters: Elytra dark brownish. Posterior corners of pronotum less projecting laterally. Apex of aedeagus in dorsal view completely rounded (comp. Figs. 15 and 16).

Distribution: Currently, the species is only known from the type locality.

Etymology: The species is named in honor of Mr. Esmaeil Mansori Nejad Admadi who helped a lot during the expeditions where the new species were discovered.

Material of other species used for comparison

Brachinus (Cnecostolus) bayardi DEJEAN, 1831: 2 ex. (SAC), Iran, Kermanshah Province, Kermanshah C., 34°19'29"N, 47°06'12"E, 1351 m a.s.l., 13.IV.2015, leg. S. Azadbakhsh.

Brachinus (Brachynidius) nigricornis GEBLER, 1829: 1 ex. (SAC), Kerman, Laleh-Zar env., 20.VI.2016, leg. S. Azadbakhsh.

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