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## Species of *Monolepta* Chevrolat, 1836 from the Arabian Peninsula (Coleoptera, Chrysomelidae, Galerucinae)

by Christiane Schlich & Thomas Wagner<sup>1)</sup>

**Abstract.** The Arabian species of *Monolepta* Chevrolat, 1836 are revised. Three valid species were previously known from this region: the Arabian endemics *M. arvensis* Bryant, 1957 and *M. saudica* Medvedev, 1996, and *M. lepida* Reiche et Saulcy, 1858. The last-mentioned occurs northwards to Jordan and also on the western side of the Red Sea from Egypt to Somalia. Other species recorded from this area are misinterpretations of taxa restricted to the continental African fauna, or already transferred to other genera, such as *Galerudolphia arabica* (Medvedev, 1996). *Monolepta heydeni* Joannis, 1866 is a valid species with similar distribution to *M. lepida*, but needs to be transferred to another genus, particularly in respect of the characters of its genitalia. One species, *M. carsteni* sp.nov. is newly described here. Redescriptions or descriptions are given for all four valid Arabian species of *Monolepta*, including detailed drawings of external patterns and genitalia, distribution maps, photographs of the primary types and an identification key.

**Key words.** Chrysomelidae – Galerucinae – *Monolepta* – Arabia – Afrotropical Region – Palearctic Region – revision – new species – key

### Introduction

The first detailed publication on leaf beetles of the Arabian Peninsula was presented by BRYANT (1957), who published data on insects collected by H. Scott and E. Britton during an expedition in 1937–1938. The material is deposited in the Natural History Museum in London, and comprises 58 chrysomelid species, mainly from Yemen and the western coast of Saudi Arabia. Many years later, far more material was collected by expeditions undertaken by W. Büttiker and colleagues in Saudi Arabia and Oman; the specimens gathered are deposited in the Naturhistorisches Museum, Basel. This material has studied by several specialists and the data on chrysomelids are published mainly in the “Fauna of Saudi Arabia” series (for details, see MEDVEDEV 1996). The Chrysomelidae of the Arabian Peninsula are presented in an overview by MEDVEDEV (1996), a study that includes data on the taxonomy, morphology, and distribution of 155 species of leaf beetles, including 21 species of Galerucinae. With this contribution, the number of known species in this group has nearly doubled since BRYANT (1957).

Within the galerucines, *Monolepta* Chevrolat, 1836 is the most diverse group and MEDVEDEV (1996) listed seven species for Arabia. Since then, one of them, *Monolepta arabica* Medvedev, 1996 has been transferred to *Galerudolphia* Hincks, 1949 (BOLZ & WAGNER 2005). Of the remaining six species, “*Monolepta*” *heydeni* Joannis, 1866 may be considered not congeneric with *Monolepta* in the light of a comprehensive study of the genotype of the *Monolepta bioculata* (Fabricius, 1781) group (WAGNER 2007a). A revision of this species will be provided later.

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<sup>1)</sup>35th contribution to the taxonomy, phylogeny and biogeography of the Galerucinae.

Of the remaining five species, three names, *M. bioculata* (Fabricius, 1781), *M. rubricosa* Gerstäcker, 1871, and *M. pygidialis* Jacoby, 1906 arise out of misinterpretations. These species do not occur outside the African continent. On the basis of the identification key given by MEDVEDEV (1996) only three species, *M. lepida* Reiche et Saulcy, 1858, *M. arvensis* Bryant, 1957 and *M. saudica* Medvedev, 1996 remain valid species of *Monolepta* from this region. A fourth one is newly described here. Redescription and descriptions including detailed drawings of external and genital structures for all species, distribution maps, and an identification key for *Monolepta* from the Arabian Peninsula are presented.

### Material and methods

A standard set of figures applies to each species. This includes indication of coloration, shown in dorsal view, including the right antenna of the beetle. The colours are represented by black (= black coloration), white (= yellow coloration) or stippling (= red or brownish coloration). In addition to this, the basal four antennomeres of each sex, the male genitalia (median lobe) from dorsal, lateral and ventral views, the latter without endophallic structures, and the female genitalia (spermatheca and bursa sclerites) are shown.

The morphometric measurements are: total length from the clypeus to the apex of the elytron, the elytral length, the maximum width of both elytra combined, and the width of the pronotum. Relative measurements are the ratio of length to width of the pronotum and maximum width of both elytra to length of the elytron. Additionally, the proportion of lengths of antennomeres 2 and 3 and of 3 and 4 are calculated. The number of specimens used for these measurements is given for each species next to the information on "total length".

### Material

The following abbreviations are used for the places in which the material is deposited (curators in brackets):

BMNH	.....	Natural History Museum, London (S. Shute)
CMe	.....	L. N. Medvedev Collection, Moscow
FMNH	.....	Finnish Museum of Natural History, Helsinki (H. Silfverberg)
MCSN	.....	Museo Civico di Storia Naturale, Genova (R. Poggi)
MNHN	.....	Musée National d'Histoire Naturelle, Paris (N. Berti †)
NHMB	.....	Naturhistorisches Museum, Basel (E. Sprecher)

### Redescriptions

#### *Monolepta lepida* Reiche et Saulcy, 1858

(Figs 1–7)

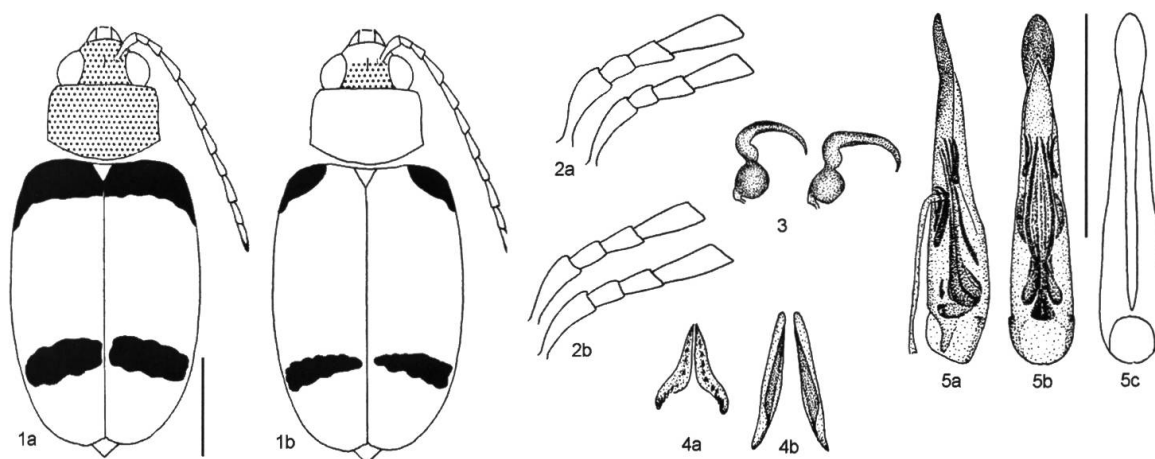
*Monolepta lepida* Reiche et Saulcy, 1858: 44–46.

**Type material.** Holotype: ♀ "Vog. de Saulcy, Jerusalem / *Monolepta lepida* Reiche 1858 / Muséum Paris 1952 coll. R. Oberthur" (MNHN; Fig. 7). Type locality: Israel, Jerusalem, after original publication "des bords du Jourdain". This place is approximately 30 kilometres east of the centre of Jerusalem. REICHE (SAULCY (1858)

have already given a detailed description of external characters and coloration and additionally provided an excellent figure (pl. 1, fig. 10; WAGNER 2005). His description is probably based on a single specimen because he mentions M. Azambre in the journal “Annales de la Société Entomologique” “r qui dois un bel individu de cette espèce, ...”, which is considered to be the holotype. The original description was repeated in JOANNIS (1866).

**Further material examined** (n = 59). EGYPT. 9 ex., Gebel Elba, 22°10'N/36°21'E, I.1933 & III.1938, H. Priesner (NHMB); 1 ex., Oasis Feiran, 28°42'N/33°37'E, V.1935, Coll. Alfieri (NHMB); 3 ex., Wadi Feran, 28°40'N/33°10'E, II.–III.1935, W. Wittmer (NHMB). – ERITREA. 2 ex., Agorgat, 15°33'N/ 37°53'E, I.1906, D. Figini (MCSN). – Israel. 2 ex., Wadi Arugod, Ein Gedi, 31°26'N/35°22'E, III.1963, W. Wittmer (CMe). – JORDAN. 1 ex., Wadi Schaib, 100 m, XI.1959, J. Klapperich (NHMB). – OMAN. 1 ex., Dhofar, 17°06'N/54°39'E, X.1979, T. B. Larsen (NHMB); 1 ex., Dhofar, Ain Rzat, Salalah, 17°1'N/54°4'E, II.1989, W. Wittmer (NHMB); 2 ex., 30 km W Salalah, Wadis nr. Al Mughsayi, II.1998, G. Wewalka (NHMB). – PALESTINE. 2 ex., Jericho, 31°52'N/35°26'E, IV. 1899 (MNHN). – SAUDI ARABIA. 1 ex., Asir Mts., 15.VII. Kamish Mushaid-Najran (40 km), A. S. Talhouk (NHMB); 1 ex., Jebel Ibrahim, 20°25'N/41°11'E, 1540 m, VIII.year?, W. Büttiker (NHMB); 3 ex., Shileam, XI.1935, R. C. M. Darling (BMNH); 2 ex., Wadi Johan, Abha, 18°12'N/42°30'E, 2150 m, IV.1976, Wittmer & Büttiker (NHMB); 1 ex., Wadi ad Dilla, 1120 m, X.1979, W. Büttiker (NHMB); 1 ex., Al Alayyah, 19°36'N/41°58'E, 1950 m, X.1979, W. Büttiker (NHMB); 6 ex., Thanomah, 1950 m, IV.1980, W. Büttiker (1 ex. CMe, 5 ex. NHMB); 1 ex., Riyadh, 24°38'N/46°46'E, V.1980, W. Büttiker (NHMB); 1 ex., An Nimas, 19°7'N/42°8'E, VII.1981 (CMe); 1 ex., Jizan, 16°53'N/42°33'E, III.1984, A. S. Talhouk (NHMB); 1 ex., Bani Rizam, 18°20'N/42°28'E, 2230 m, IX.1984, W. Büttiker (CMe); 1 ex., Harithi, 21°18'N/40°18'E, IV.1985, W. Büttiker (NHMB). – SOMALIA. 1 ex., Br. Somaliland, 10°0'N/48°0'E, B.M. 1929–398, W. A. Macfadyen (BMNH); 1 ex., Burao, 9°31'N/45°34'E, Br. Somaliland, VII.1942, J. R. Audy (BMNH); 3 ex., Run, Garee, VIII.1964, Miss. Biol. (NHMB); 5 ex., Run, 8°47'N/48°56'E, VII.1969 (NHMB); 1 ex., Taleh, 9°8'N/48°25'E, IV.1980 (NHMB). SYRIA. 2 ex., (no further data on location or time) Baly Coll. (BMNH). – YEMEN. 1 ex., Jebel Jihaf, Wadi Leje, ca. 13°41'N/44°43'E, 6300–6700 ft, X.1937, Scott & Britton (BMNH); 1 ex., Wadi Natid, Kirsh, 13°22'N/44°32'E, 2300 ft, XII.1937, Scott & Britton (BMNH).

**Note.** A detailed redescription of this species has already been given by WAGNER 2005. *Monolepta lepida* is the only Arabian species of this genus that occurs in Arabia and on



**Figs 1–5.** *Monolepta lepida* Reiche et Saulcy, 1858: 1 – colour pattern; 2 – basal antennomeres (a: ♂, b: ♀); 3 – two different spermathecae; 4 – bursa sclerites (a: dorsal, b: ventral); 5 – median lobe (a: lateral, b: dorsal, c: ventral, without endophallic structures). Scale for colour pattern different from same scales for basal antennal articles and genital structures: each 1 mm (same for all other figures).

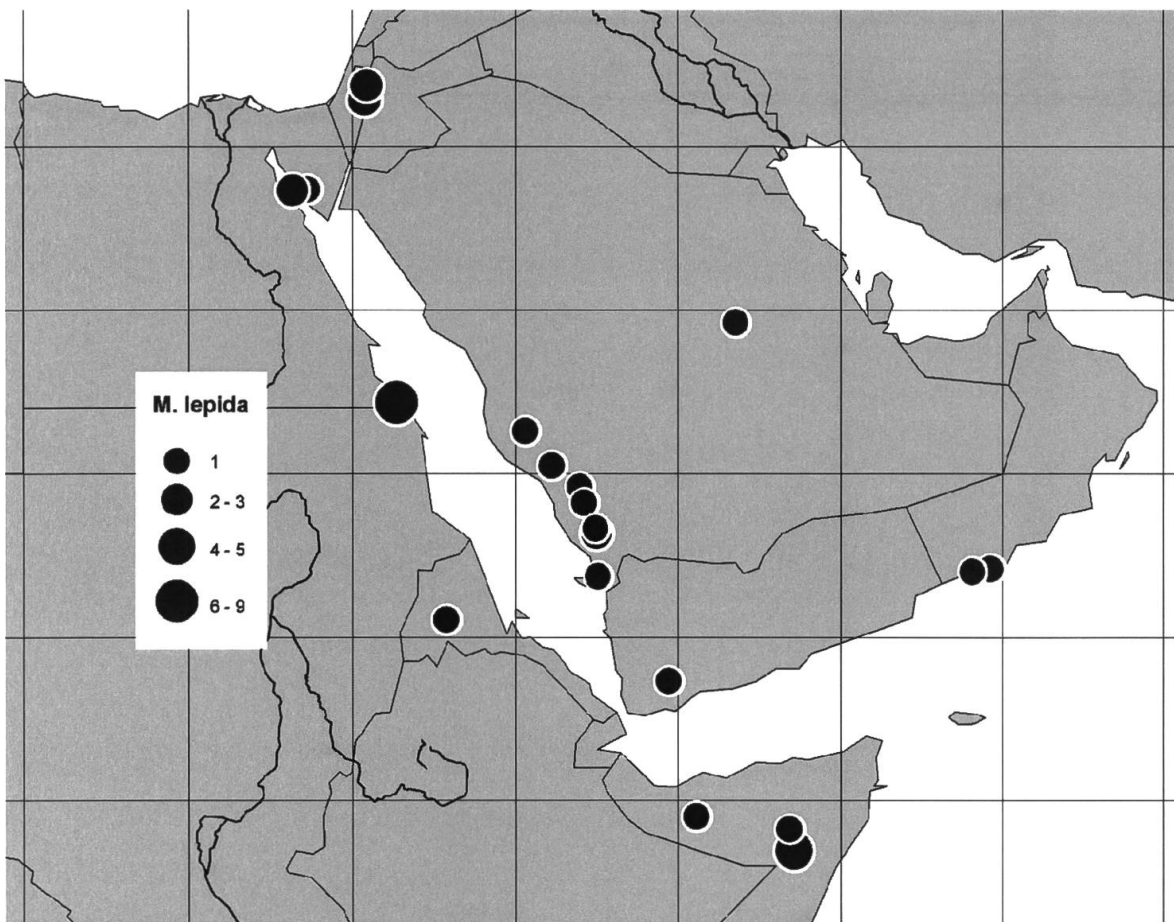


Fig. 6. Distribution of *Monolepta lepida* Reiche et Saulcy, 1858.

the African continent. Herein, the redescription is partly repeated, and results from newly studied specimens and new distribution data are added.

**Redescription.** Total length. 3.80–5.30 mm (mean 4.68 mm;  $n = 10$ ).

**Head.** Characterized by pale yellowish-red coloration (Fig. 1a), frons paler yellow (Fig. 1b). Antennae pale yellow with the tip of the terminal antennomere black (Fig. 1). Antennomeres 4–11 slender, about four times longer than broad at apex (Fig. 2). The ratio of lengths of antennomeres 2:3 is 0.75–0.88 (mean 0.84) and for antennomeres 3:4 it is 0.46–0.54 (mean 0.49).

**Thorax.** Prothorax pale yellow (Fig. 1b) to yellowish-red (Fig. 1a), pronotal width 1.10–1.55 mm (mean 1.33 mm), pronotal length-to-width 0.63–0.67 (mean 0.66), surface very finely punctured. Elytra pale yellow to yellowish-red, marked with a narrow, transverse black band at base (Fig. 1a), where the black coloration is occasionally reduced to humeri only (Fig. 1b). The other transverse, sub-apical band is also narrow. Some specimens from Oman have a yellowish-red head and pronotum and elytra with larger, more circular, sub-apical elytral spots. Elytral length 2.80–3.80 mm (mean 3.41 mm), maximum width of both elytra 2.00–2.70 mm (mean 2.34 mm). Ratio

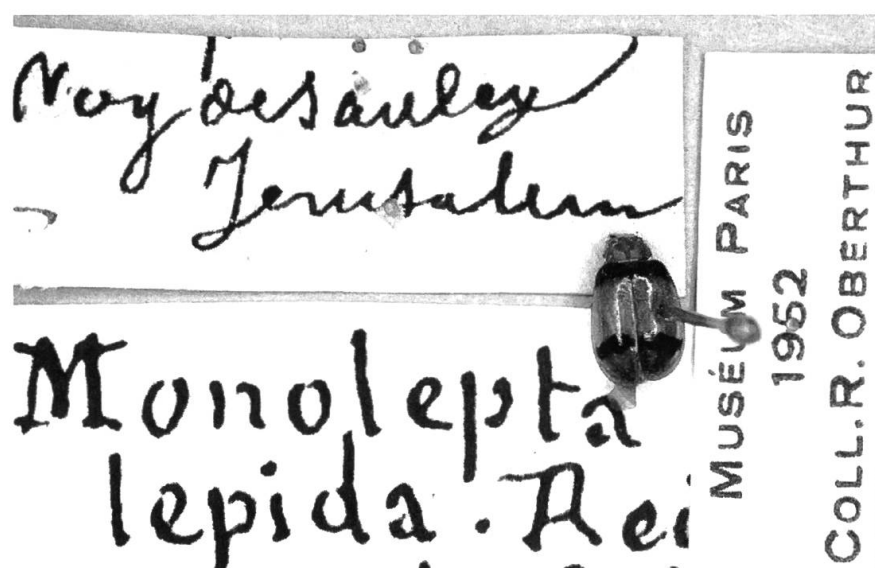


Fig. 7. Holotype of *Monolepta lepida* Reiche et Saulcy, 1858 and its labels.

of maximum width of both elytra to the length of the elytron is 0.65–0.70 (mean 0.68). The scutellum is yellow to yellowish-red, meso- and metathorax and legs yellow. Legs may occasionally be yellowish-red, tibia and tarsus are always pale yellow.

Abdomen. Pale yellow to yellow.

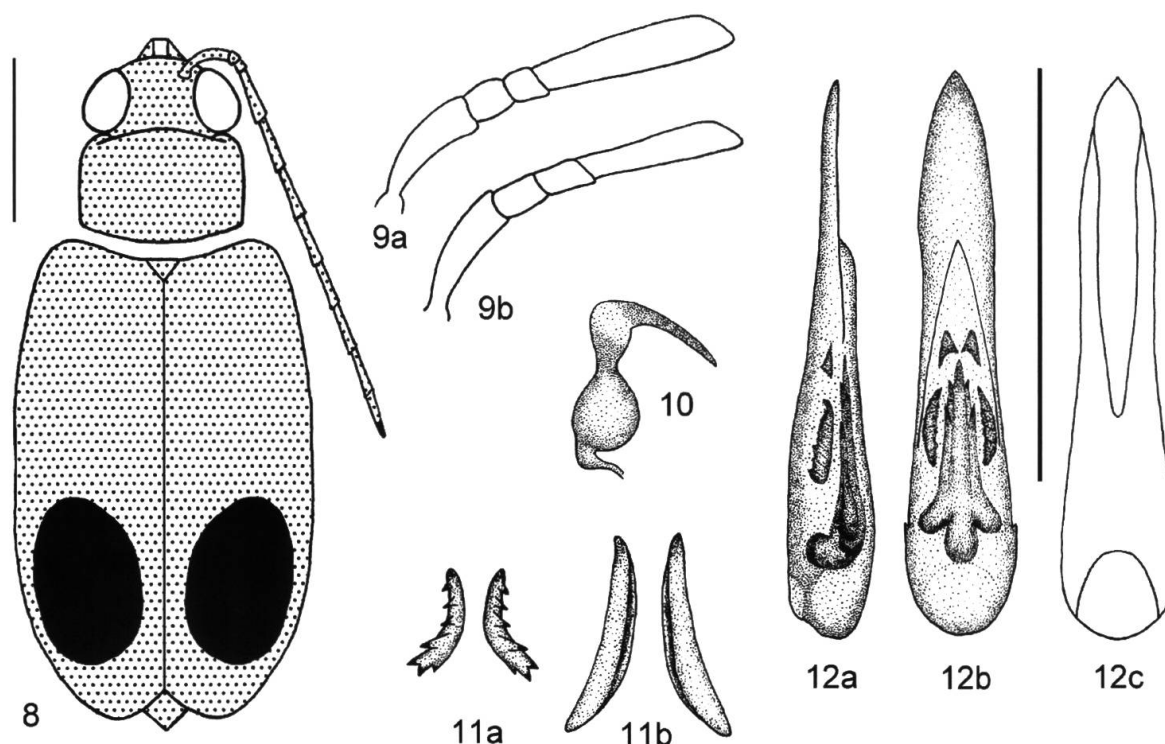
Female genitalia. The spermatheca is characterized by its spherical nodulus and has a comparatively broad middle part and cornu (Fig. 3). The dorsal part of the bursa sclerites is slender and bears a row of hooks at base (Fig. 4a); the ventral part is also characterized by its noticeably slender shape and an outer margin that is very finely serrate (Fig. 4b).

Male genitalia. The median lobe is straight, conical, with the apical part widening, spoon-like (Fig. 5b) and bent downwards (Fig. 5a). The tectum is slender and pointed at apex (Fig. 5b), the ventral groove is parallel-sided and also remarkably slender (Fig. 5c). The lateral endophallic spiculae are slender and of long, bifurcate structure. The dorsal pair of median endophallic spiculae is stronger, and very long, while the other median spiculae are long, but more slender. The ventral spiculae are differently organized since they are separated into two portions and hooked at apex (Figs 5a, b).

**Distribution.** The geographical range of this species is unique within *Monolepta*. Most specimens known have been found in Arabia, but this species also reaches the Palearctic Region in Israel and Jordan and also occurs on the African continent west of the Red Sea in Egypt, Eritrea and Somalia (Fig. 6). All other known species of “true” *Monolepta* from the Afrotropical Region occur either in Africa or on the Arabian Peninsula.

**Differential diagnosis.** The species may easily be distinguished from the other Arabian species of *Monolepta* by the elytral coloration with its two transverse black bands (Fig. 1). Apart from the different coloration, *M. lepida* has third antennomere significantly





**Figs 8–12.** *Monolepta arvensis* Bryant, 1957: 8 – colour pattern; 9 – basal antennomeres (a: ♂, b: ♀); 10 – spermatheca; 11 – bursa sclerites (a: dorsal, b: ventral); 12 – median lobe (a: lateral, b: dorsal, c: ventral, without endophallic structures).

longer than second (Fig. 2), which distinguishes the species from *M. arvensis* (Fig. 9) and *M. carsteni* sp.nov. (Fig. 22). Also, the median lobe of *M. lepida* with its spoon-like, widened apical part (Fig. 5), is a very distinctive character.

**Remarks.** Some specimens with more reddish dorsal coloration and broader elytral bands resemble *M. rubricosa* Gerstäcker, 1871 and are listed under this name (BRYANT 1957, MEDVEDEV 1996). *Monolepta rubricosa* is found in continental Africa only and occurs in eastern and southern Africa from southern Kenya towards southern Congo, eastern Namibia and Natal in South Africa (WAGNER 2000). Some further specimens of *M. lepida* have been misidentified as *M. pygidialis*. Both species are very similar in size and coloration pattern, but *M. pygidialis* is restricted to southern Africa.

### *Monolepta arvensis* Bryant, 1957

(Figs 8–14, 28)

*Monolepta arvensis* Bryant, 1957: 362.

**Type material.** Holotype. ♀ “W. Aden Prot., Jebel Jihaf ca. 7000 ft, 6.X.1937 / B. M. Exp. to S. W. Arabia, H. Scott & E. B. Britton, B. M. 1938–246 / *Monolepta arvensis* Bryant 1957” (BMNH; Figs 14, 28); type locality: Yemen, Jebel Jihaf, approx. 13°41'N/44°43'E. Holotype by original designation.

**Further material examined** (n = 11). SAUDI ARABIA. 1 ex., Al Alayyah, 19°36'N/41°58'E, X.1979, W. Büttiker (CMe). – YEMEN. 10 ex., Jebel Jihaf, ca. 13°41'N/44°43'E, ca. 7000–7100 ft, IX.–X.1937, H. Scott & E. B. Britton (BMNH, 1938–246).

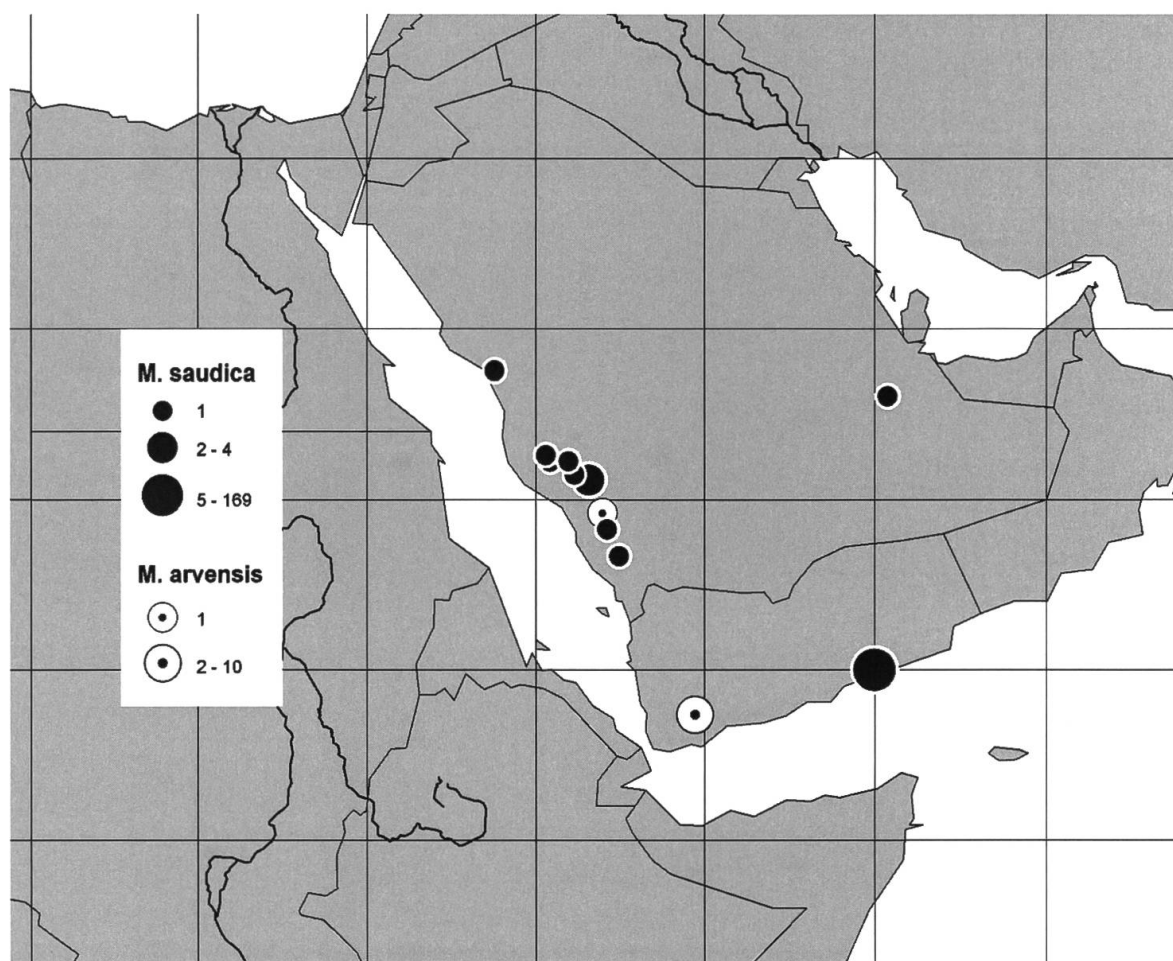


Fig. 13. Distribution of *Monolepta arvensis* Bryant, 1957 and *Monolepta saudica* Medvedev, 1996.

**Redescription.** Total length. 3.65–4.50 mm (mean: 4.19 mm;  $n = 10$ ).

Head. Yellowish- to reddish-brown, frons paler in some specimens. The antennae are usually paler, yellowish-red with a black tip to the terminal antennomere. The ratio of lengths of antennomeres 2:3 is 0.95–1.30 (mean 1.20); in males, in particular, the third antennomere is very short and the fourth exceptionally long and thus the 3:4 ratio varies between 0.16 and 0.33 (mean 0.21). Antennomeres 5 onwards are also markedly elongated.

Thorax. Prothorax reddish-brown to yellowish-red. Pronotal width 0.98–1.21 mm (mean 1.13 mm), pronotal length to width 0.63–0.65 (mean 0.64). Elytra yellowish to brownish-red, each elytron with a black sub-apical, usually elongated, ovate dark brown to black spot. The spot is occasionally enlarged and may spread over half the length of the elytron. Elytral length 2.60–3.60 mm (mean 3.21 mm), maximum width of both elytra together 1.60–2.30 mm (mean 2.02 mm). The elytra are very slender and thus the ratio of maximum width of both elytra to length of elytron is 0.54–0.69 (mean 0.63). The scutellum is same colour as the elytra, significantly darker in only a few specimens. Meso- and metathorax light brownish, legs are yellowish to pale reddish-brown.



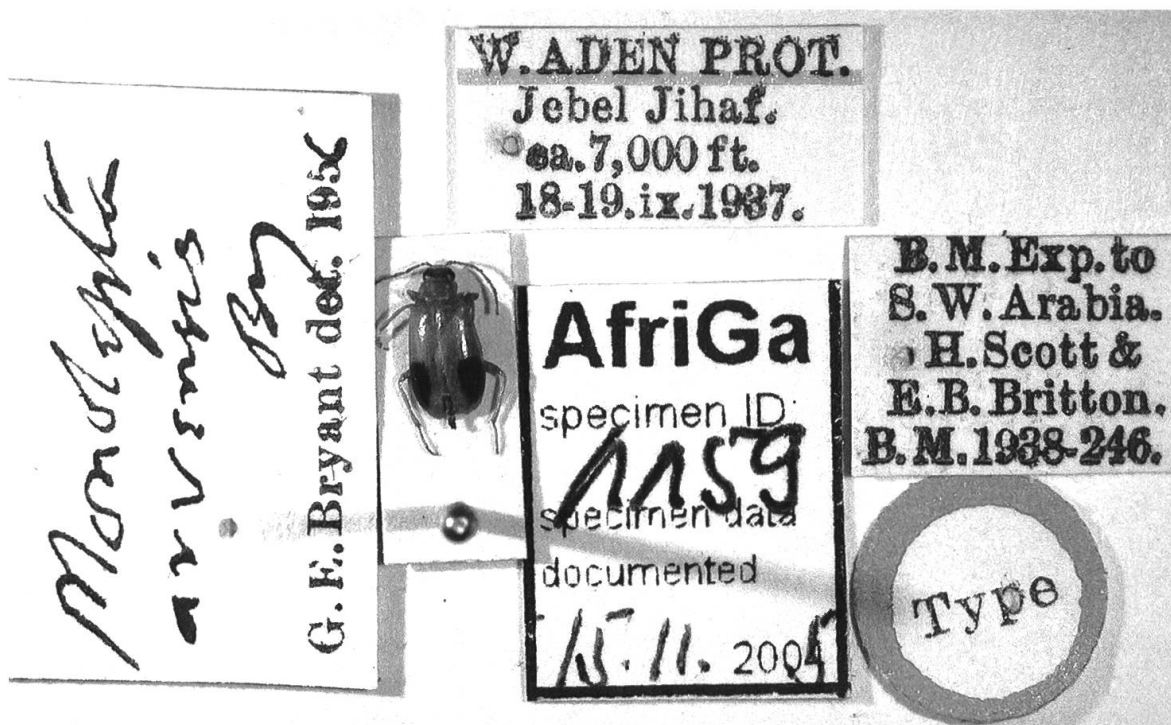


Fig. 14. Holotype of *Monolepta arvensis* Bryant, 1957 and its labels.

Abdomen. Yellowish- to reddish-brown.

Female genitalia. The spermatheca has a slender, ovate nodulus with a comparatively broad middle part and only slightly bent, short cornu. Both bursa sclerites are also slender, and the dorsal pair may easily be identified by its characteristically large spines.

Male genitalia. The median lobe is straight, dorsoventrally significantly compressed, enlarged in the apical third in dorsal view, and is pointed at the apex. The median spiculae are short but broad, ventral spiculae are short, triangular, comb-like (Fig. 12a). The tectum is short and broad with pointed apex (Fig. 12b), the ventral groove is broad, parallel-sided, and reaches only over the apical half of the median lobe (Fig. 12c).

**Distribution.** The known material of this species is restricted to few sites in the southwestern part of the Arabian Peninsula (Fig. 13).

**Differential diagnosis.** *Monolepta arvensis* is a comparatively small species with very slender elytra which, taken together, are nearly twice as long as wide. Also the short second and third antennomeres, the very elongated apical antennomeres, and the yellowish- to reddish-brown dorsum with a large subapical dark brown to black spot on each elytron are very distinctive characters in *Monolepta* and allow easy identification of this species.

***Monolepta saudica* Medvedev, 1996**

(Figs 13, 15–20, 29)

*Monolepta saudica* Medvedev, 1996: 253.

**Type material.** Holotype. ♂ “Saudi Arabia, Thanomah, 1950 m, 11.IV.1980 / Saudi Arabia, W. Büttiker / Holotypus *Monolepta saudica* m. L. Medvedev det. 1994” (NHMB; Figs 20, 29); type locality: Saudi Arabia, Thanomah. Holotype by original designation. – Paratype. 1 ex., Harithi, 21°18'N/40°18'E, IV.1985, W. Büttiker (NHMB).

**Further material examined** (n = 175). OMAN. 1 ex., near Baushar, 23°02'N/50°23'E, XI.1989, M. D. Gallagher (NHMB). – SAUDI ARABIA. 1 ex., An Nimas, 19°7'N/42°7'O, VII.1981 (NHMB); 1 ex., Bani Rizam, 18°20'N/42°28'E, 2230 m, IX.1984, W. Büttiker (NHMB); 1 ex., Makkah, Al Uqdah, 21°07'N/40°25'E, 1780 m, V.1985, W. Büttiker (NHMB); 1 ex., Wadi Nimar, 21°08'N/40°58'E, 1500 m, V.1983, W. Büttiker (NHMB); 1 ex., W. Büttiker (NHMB). – YEMEN. 169 ex., Hadramaut, Wadi Doad, ca. 15°0'N/50°0'E, IV.1992, R. Linnavuori (FMNH).

**Redescription.** Total length. 3.75–4.95 mm (mean: 4.54 mm; n = 10).

**Head.** Usually yellowish-red with paler frons (Fig. 15); in general, the head is slightly darker, in contrast to the pronotum and elytra. Antennae lighter yellow, last antennomeres gradually revealing a brownish touch with the tip of the antennae marked by black (Fig. 15). Ratio of length of antennomeres 2:3 is 0.74–0.89 (mean 0.85), that of 3:4 standing at 0.41–0.53 (mean 0.46). The second antennomere is always shorter than the third, while antennomeres in males are generally broader (Fig. 16a).

**Thorax.** The prothorax is pale yellow (Fig. 29), pronotal width 1.19–1.33 mm (mean 1.26 mm), pronotal length to width 0.63–0.70 (mean 0.67). The elytra are the same colour as the prothorax, yellow to pale yellow throughout, 2.75–3.50 mm (mean 3.26 mm) long, maximum width of both elytra together 2.00–2.40 mm (mean 2.24 mm), maximum width of both elytra to length of elytron 0.64–0.74 (mean 0.69). The scutellum is the same colour as the elytra. The mesothorax is usually reddish-yellow, the metathorax either be yellow or reddish; legs yellow to pale yellow throughout.

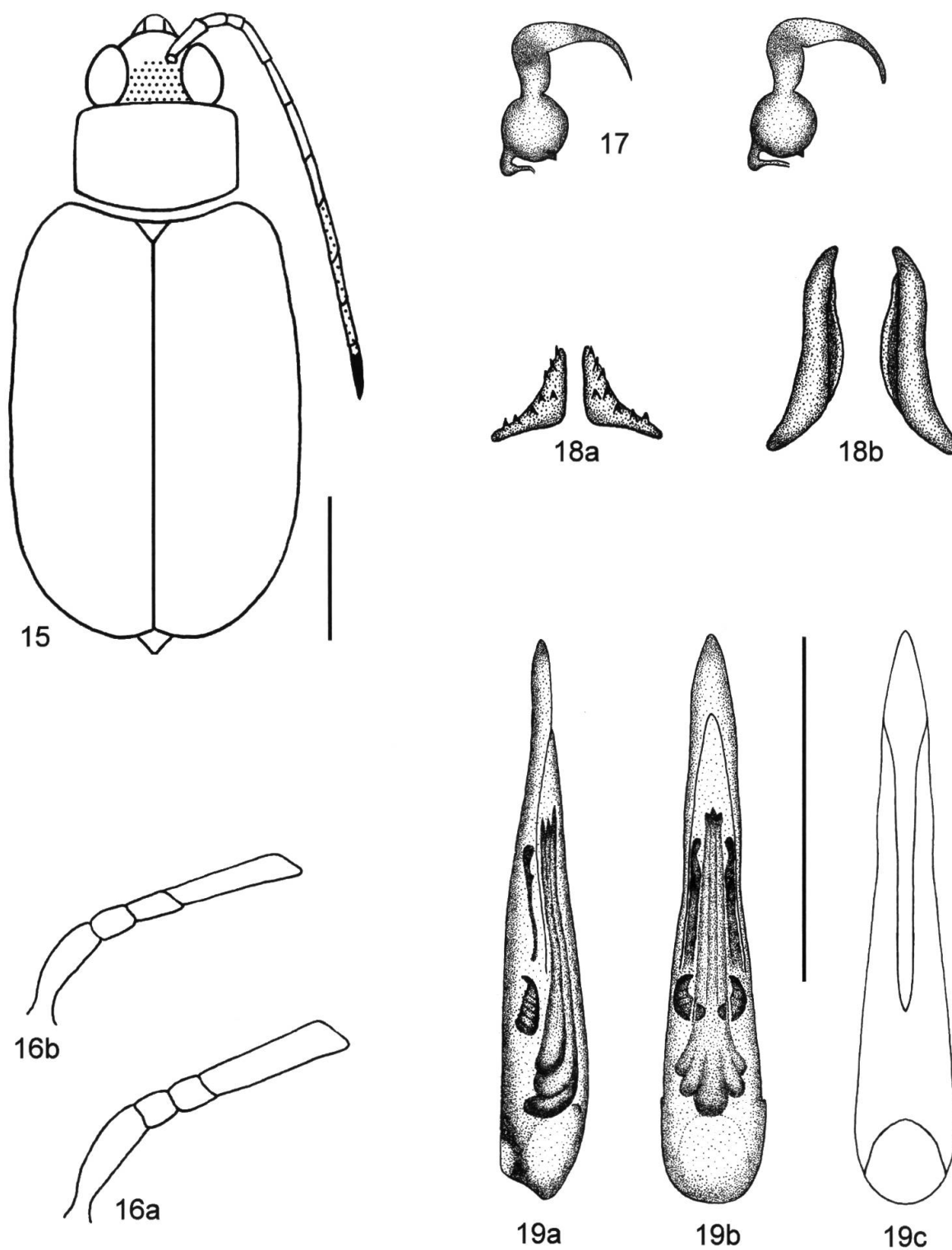
**Abdomen.** Yellow to pale yellow.

**Female genitalia.** The spermatheca is characterized by its spherical nodulus, a broad middle part that blends into a relatively bulky, short, slightly bent cornu (Fig. 17). The dorsal part of the bursa sclerites is triangular and widely-covered by small spines (Fig. 18a); ventral part of sclerites slender, outer margin finely undulate in shape (Fig. 18b).

**Male genitalia.** The median lobe is lancet-shaped, sub-apically slightly narrowed, slender and slightly curved in lateral view (Fig. 19b). The tectum is long, conical and pointed at the apex (Fig. 19b); the ventral groove is slender and parallel-sided (Fig. 19c). Lateral and median spiculae are long, and the slender, ventral spiculae broad and comb-like (Figs 19a, b).

**Distribution.** Known from several sites in south-western Saudi Arabia, one site in Oman and a large series from Hadramaut in Yemen (Fig. 13).

**Differential diagnosis.** *Monolepta saudica* is the only entirely yellow Arabian species of *Monolepta* and may thus quite easily be distinguished from the other three species from this region. There are a few other galerucines with entirely yellow dorsum possessing an elongated basi-metatarsus that might be confused with this species. *Galerudolphia arabica* (Medvedev, 1996) may be distinguished by its broad trapezoidal pronotum (BOLZ & WAGNER 2005), species of *Calomicrus* or *Nymphius* in some cases by their specific abdominal extrusions in males, or, in doubtful cases, by the shape of the median lobe or the spermatheca.



**Figs 15–19.** *Monolepta saudica* Medvedev, 1996: 15 – colour pattern; 16 – basal antennomeres (a: ♂, b: ♀); 17 – two different spermathecae; 18 – bursa sclerites (a: dorsal, b: ventral); 19 – median lobe (a: lateral, b: dorsal, c: ventral, without endophallic structures).

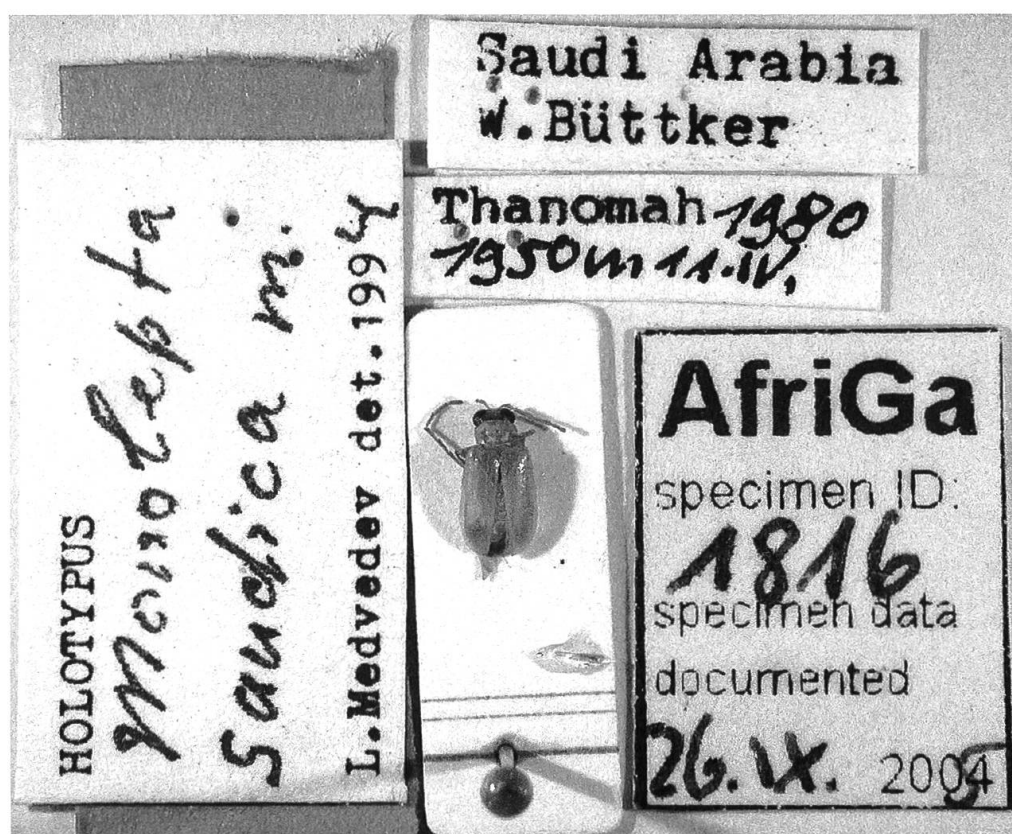


Fig. 20. Holotype of *Monolepta saudica* Medvedev, 1996 and its labels.

### Description of new species

#### *Monolepta carsteni* sp.nov.

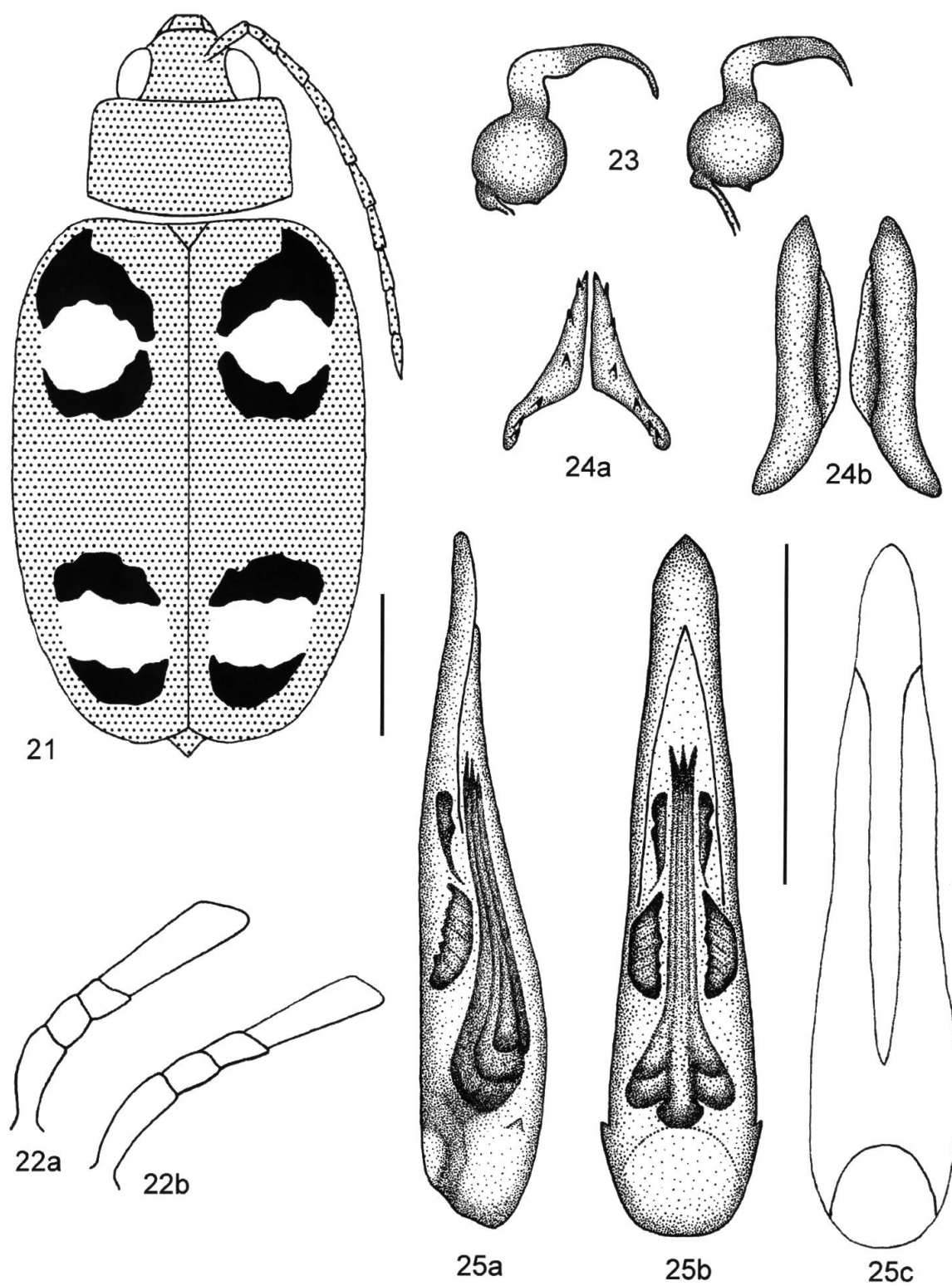
(Figs 21–27, 30)

**Type material.** Holotype ♂ “W. Aden Protectorate, Jebel Jihaf, ca. 7000 ft, 6.X.1937 / B. M. Exp. to S. W. Arabia, H Scott & E.B. Britton, B. M. 1938–246 / from edges of cultivated fields / Holotypus *Monolepta carsteni*, Schlich & Wagner 2010” (BMNH; Figs 27, 30); type locality: Yemen, Jebel Jihaf, approx. 13°41'N/44°43'E.

**Paratypes.** SAUDI ARABIA. 1 ex., Wadi Nimar, 21°08'N/40°58'E, 1500 ft, V.1983, W. Büttiker (BMNH). – YEMEN. 1 ex., Mahwit, Al Mahwit, 15°28'N/43°34'E, III.1992, R. Linnavuori (FMNH); 5 ex., Usaifira, 1 mile N of Ta'izz, 13°35'N/44°02'E, ca. 4500 ft (taken from cultivated fields), XII.1937, H. Scott & E. B. Britton (BMNH, 1938–246); 57 ex., Jebel Jihaf, ca. 13°41'N/44°43'E, ca. 7000–7700 ft. (of these, 9 ex. are proven to be taken from edges of terraced and 11 ex. from edges of cultivated fields), IX.–X.1937, H. Scott & E. B. Britton (BMNH, 1938–246).

**Description.** Total length. 4.60–6.00 mm (mean: 5.24 mm; n = 10).

**Head.** Completely yellowish- to brownish-red (Fig. 30). Antennae yellow with final antennomere usually black. The ratio of lengths of antennomeres 2:3 is 1.00–1.40 (mean 1.10), of 3:4 it is 0.21–0.41 (mean 0.31). Antennomeres in males generally broader and rather bulkier than those in females (Figs 22a, b).



**Figs 21–25.** *Monolepta carsteni* sp.nov.: 21 – colour pattern; 22 – basal antennomeres (a: ♂, b: ♀); 23 – two different spermathecae; 24 – bursa sclerites (a: dorsal, b: ventral); 25 – median lobe (a: lateral, b: dorsal, c: ventral, without endophallic structures).



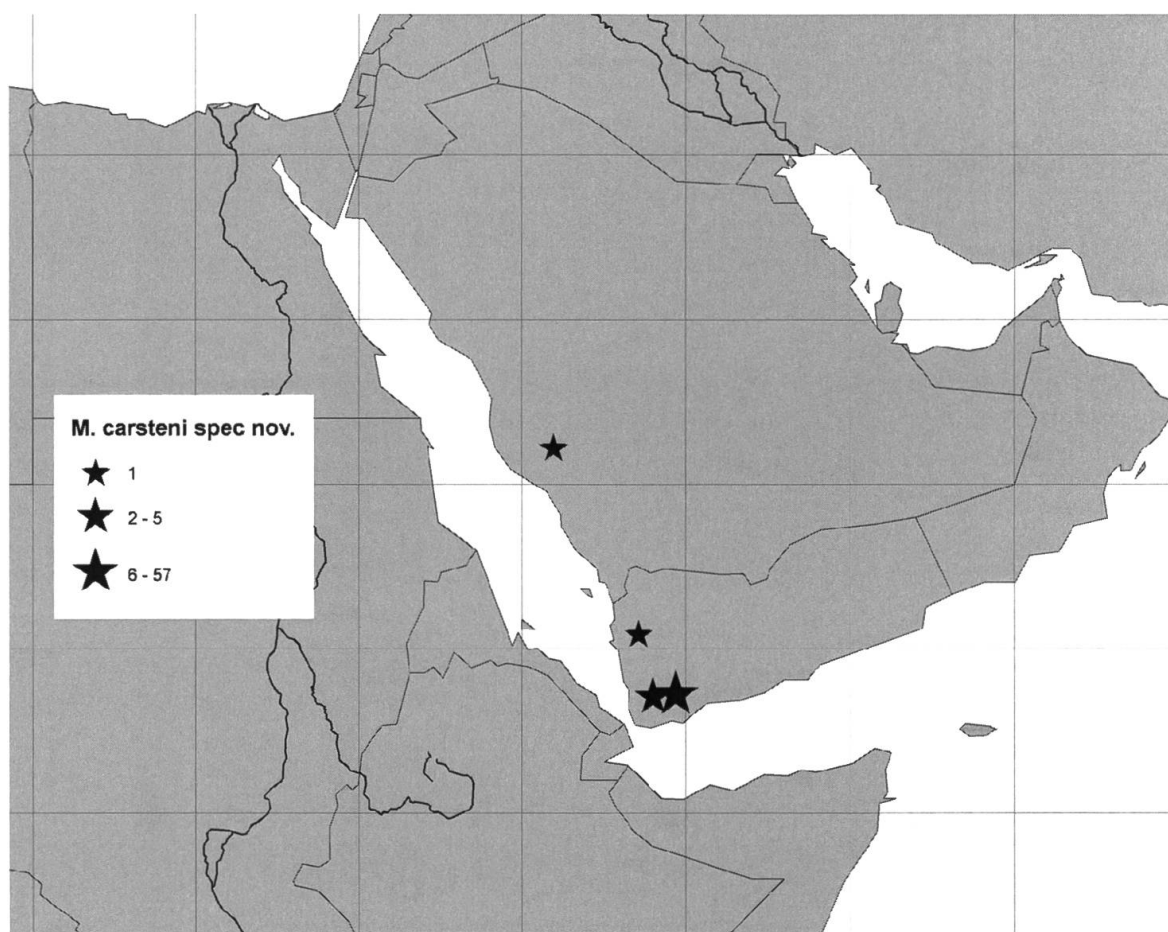


Fig. 26. Distribution of *Monolepta carsteni* sp.nov.

Thorax. Prothorax yellowish- to brownish-red, usually slightly paler than head. Width of pronotum 1.35–1.77 mm (mean 1.56 mm), length to width of pronotum 0.53–0.65 (mean 0.57). The elytra are also yellowish- to brownish-red. Elytral length 3.70–5.05 mm (mean 4.25 mm), maximum width of 2.90–3.60 mm for both elytra (mean 3.21 mm), maximum width of both elytra to length of elytron 0.71–0.81 (mean 0.76). *Monolepta carsteni* sp.nov. has two bicoloured circular spots, their centres yellow and their margins partly black (Figs 21, 30). The scutellum is brown-reddish and thus has the same coloration as the elytra. The meso- and metathorax are yellowish-red, the legs are usually paler reddish-yellow.

Abdomen. Yellowish-red.

Female genitalia. The spermatheca of *M. carsteni* sp.nov. possesses a very spherical nodule, but a short middle part and a rather slender cornu that is sharply bent at the end (Fig. 23). Thus, the spermatheca has a rather stout and compact appearance. The dorsal pair of the bursa sclerites has a triangular structure and has hooks at its base (Fig. 24a), while the ventral part is slender and finely undulate at the outer margin (Fig. 24b).



Male genitalia. The median lobe of *M. carsteni* sp.nov. is conical, straight and slightly pointed at the apex (Figs 25a, b). The tectum is also conical and pointed at the apex (Fig. 25); ventral groove slender, parallel-sided (Fig. 25c). The lateral endophallic spiculae are elongated and strongly sclerotized, median spiculae long, slender; ventral spiculae quite large (Figs 25a, b).

**Distribution.** Mainly known from south-eastern Yemen, with only one from adjacent areas in Saudi Arabia (Fig. 26).

**Etymology.** The species is dedicated to Christiane Schlich's brother Carsten.

**Differential diagnosis.** In size and coloration, *M. carsteni* sp.nov. is the most outstanding of all Arabian species of this genus. The species is significantly larger than all other Arabian species and can easily be identified by its peculiar coloration with large, eye-like elytral spots (Figs 21, 30). Body size, outline and in particular the male genital pattern very probably give *M. carsteni* sp.nov. a close phylogenetic relationship to the continental African *M. cruciata* Guérin de Méneville, 1847, *M. leuce* Weise, 1909 and *M. elegans* Chevrolat, 1837 (WAGNER 2007b).

**Remarks.** The coloration pattern of *M. carsteni* sp.nov. resembles *M. bioculata*, a species restricted to South Africa. Specimens recorded as *M. bioculata* from Arabia (BRYANT 1957, MEDVEDEV 1996) all belong to this new species.

#### Key to Arabian species of *Monolepta* Chevrolat, 1836

- 1 Elytra with dark brown to black bands or spots. .... 2.
- Elytra yellow throughout, median lobe conical, lancet-shaped with long median and lateral spiculae, total length 3.75–4.95 mm. ....  
..... *Monolepta saudica* Medvedev
- 2 Elytra yellow to yellowish-red with transverse bands at base and in the apical third, median lobe conical, straight, apical part spoon-like, widened (Fig. 5b), total length 3.80–5.30 mm. ....  
..... *Monolepta lepida* Reiche et Saulcy
- Elytra yellowish- to brownish-red, with circular or ovate spots. .... 3.
- 3 Each elytron with two bicoloured, circular spots in which the centre is yellow margins partly black (Fig. 21); elytra broad, median lobe conical with broad base, and long tectum (Fig. 25), total length 4.60–6.00 mm. ...  
..... *Monolepta carsteni* sp.nov.
- Each elytron with one dark brown to black, ovate spot in the apical half (Fig. 8) that may be longitudinally enlarged, elytra very slender, median lobe broad, dorsoventrally compressed, subapically enlarged with short tectum (Fig. 12), total length 3.65–4.50 mm. ....  
..... *Monolepta arvensis* Bryant

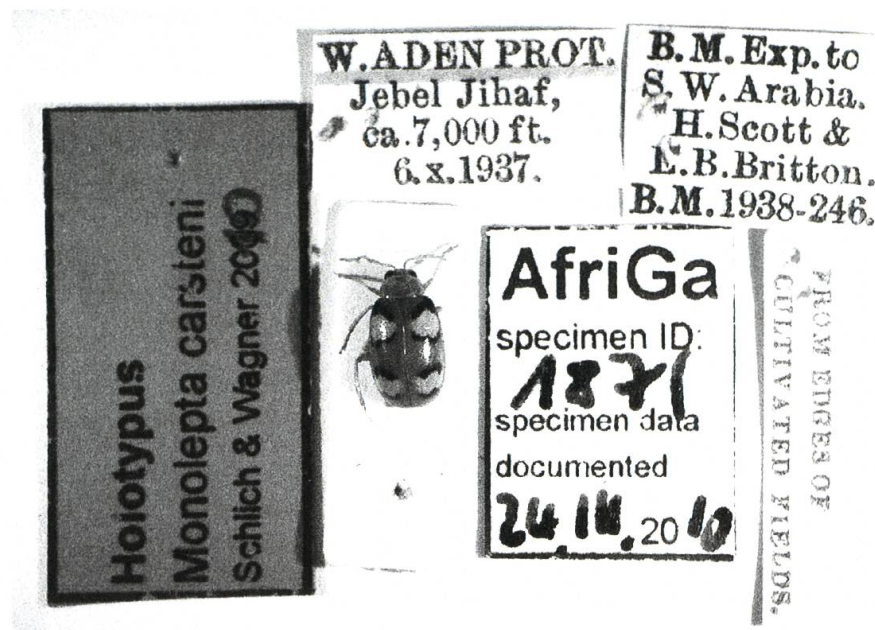


Fig. 27. Holotype *Monolepta carsteni* sp.nov. and its labels.

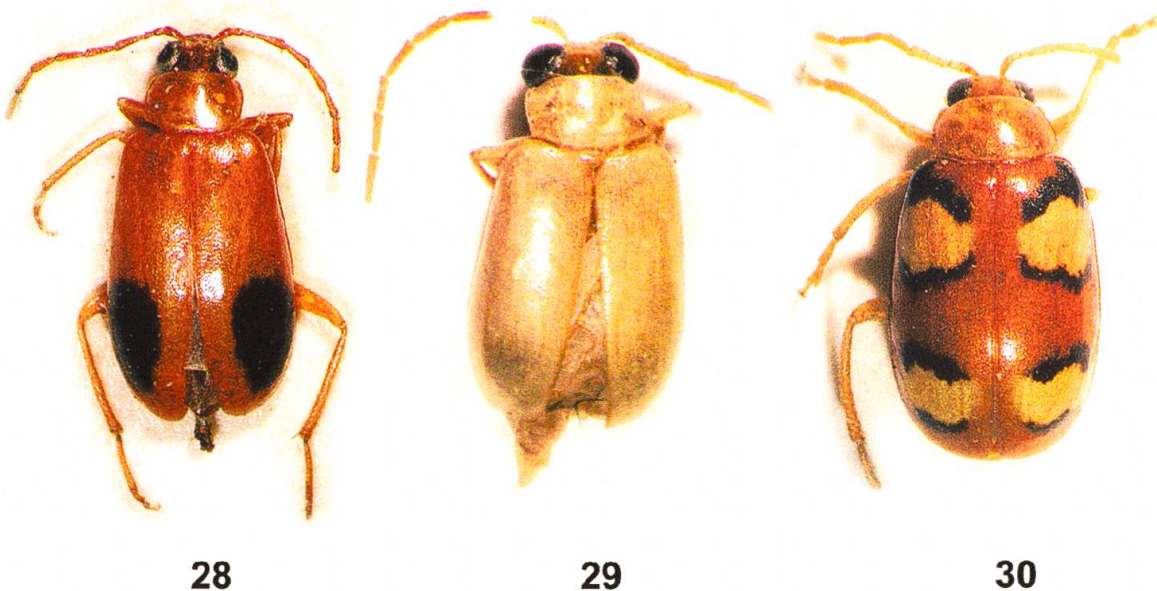


Fig. 28–31. 28 – *Monolepta lepida* Reiche et Saulcy, 1858, holotype; 29 – *M. arvensis* Bryant, 1957, holotype; 30 – *M. saudica* Medvedev, 1996, holotype; 31 – *M. carsteni* sp.nov., holotype.

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