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Stuttgarter Beiträge zur Naturkunde

aus dem Staatlichen Museum für Naturkunde in Stuttgart

Stuttgart 15. Dezember 1971 Nr. 229

On the genus *Atomophora* Rt. (Het. Miridae)

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With 3 Figures

The genus *Atomophora* Rt. (type: *A. pantherina* Rt.) was described by REUTER in 1879. At the time four species, *A. eximia* Rt., *A. pantherina* Rt., *A. alba* Rt. and *A. fuscumaculata* Rt., were known. Later, in 1901 and 1903, seven other species were added to the list: *A. bipunctata* Rt., *A. vitticollis* Rt., *A. lineata* Rt., *A. oculata* Rt., *A. maculosa* Rt., *A. albovittata* Rt. and *A. suturalis* Rt. Afterwards four species have been described: *A. macrophthalma* Poppius (1919), *A. picticornis* Horvath (1913), *A. arabica* Linnavuori (1962) and *A. subpallida* Wagner (1962). The following revision is mainly based on the material of the genus preserved in my private collection. Moreover the type material in coll. REUTER in the Helsinki Museum and a collection from Iran in the Stuttgart Museum were examined. The study revealed three new species and a new race of *A. maculosa*.

The range of the genus is Eremian. Most species occur in Transcaspia and Turkestan, from where my colleague Dr. I. M. KERZHNER, of Leningrad, is describing also some new species. The species of the genus live on desert plants, *A. nut* Lv., for example, on *Calligonum comosum*.

Key to the species

- 1 (4) Clavus, corium and cuneus densely and uniformly marked with small round dilute brownish dots. General colouring whitish grey, with a slight greenish tinge. Without any contrasted dark markings (see also *bipunctata* and *astarte*) 2
- 2 (3) Body longer and narrower, length 4 mm. Vertex broader, ocular index 1.45 (♂) or 2.0 (♀). Antennae longer and more gracile, 2nd joint nearly 1.5 (♂) or 1.35 (♀) x as long as diatone
. *albovittata* Rt. (Transcaspia)
- 3 (2) Body smaller and more robust, length 3–3.5 mm. Vertex narrower, ocular index 1.12 (♂) or 1.78 (♀). Antennae shorter and thicker, 2nd joint 1.05 (♂) or 1.18 (♀) x as long as diatone
. *alba* Rt. (Transcaspia, Turkestan)
- 4 (1) Colouring not as above 5
- 5 (6) Claval suture contrastedly dark brown, a dark stripe also along lower claval vein. Ground colouring greenish grey, with a golden tinge. Elytra with small round brown dots, apical margin of corium also with some larger dilute fuscous dots and a distinct roundish dark brown spot near inner basal angle of cuneus *lineata* Rt. (Transcaspia, Turkestan)
- 6 (5) Claval suture concolorous 7

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- 7 (8) Small species, length < 3 mm (♀). Colouring pale yellowish. Elytra with a round contrasted dark apical spot as in *lineata*, brownish dotting otherwise sparse and very indistinct *bipunctata* Rt. (Transcaspia)
- 8 (7) Elytra without a round dark apical spot in corium 9
- 9 (14) Legs pale, immaculate (see also *subpallida*) 10
- 10 (11) Body narrow, length 3—3.5 mm. Yellow. Scutellum, clavus and inner apical angle of corium with fuscous dotting, other parts of corium with orangish irroration; commissural margin of clavus dark fuscous . . .
. *suturalis* Rt. (Transcaspia, Turkestan, Iran)
- 11 (10) Body more robust. Colour pattern different 12
- 12 (13) Pronotum with two squarish discal spots, scutellum with a roughly X-shaped median figure and elytra with three spots (one in apical part of clavus, one larger and more distinct along claval suture in basal part of corium and one, irregularly shaped, at apex of corium), fuscous. Elytra moreover with minute fuscous and reddish dotting
. *fuscomaculata* Rt. (Transcaspia, Iran)
- 13 (12) Whitish yellow, upper surface medially tinged with pale reddish. Elytra with traces of indistinct small brown spots. Without larger dark markings
. *astarte* n. sp. (Israel)
- 14 (9) Tibiae with smaller or larger dark dots, also femora with dark markings 15
- 15 (16) Ground colouring whitish. Pronotum with a contrasted dark brown longitudinal band behind either eye, these bands diverging caudad. Apex of corium with a contrasted dark brown Y-shaped spot at inner basal angle of cuneus. Upper surface otherwise with only small and rather indistinct fuscous or reddish dots. Ocular index 1.8 (♂), head 0.67 x as broad as pronotum . . . *vitticollis* Rt. (Transcaspia)
- 16 (15) Ground colouring not whitish. Pronotum without contrasted dark longitudinal bands 17
- 17 (18) Eyes remarkably small, ocular index 1.65 (♂) or 2.55 (♀). Dark spotting of upper surface rather indistinct. Tibial spots indistinct or nearly absent *subpallida* Wgn. (Algeria)
- 18 (17) Eyes much larger. Tibiae with distinct dark dots 19
- 19 (22) Cuneus dark brown, with only extreme apex and basal margin whitish 20
- 20 (21) Body narrow, parallel-sided, 2.9—3 x as long as broad. Elytra with remarkably large, confluent dark spots
. *pantherina* Rt. (Transcaspia, Turkestan)
- 21 (20) Body broader, ovate, 2.3—2.6 x as long as broad. Elytra with smaller confluent dark spots *nuta* n. sp. (Algeria, Iran)
- 22 (19) Cuneus pale, with \pm dense and confluent dark irroration 23
- 23 (24) Body gracile, about 3 x as long as broad. Antennae remarkably slender, 2nd joint 1.51 (♂) x as long as diatone. Ocular index 1.15 (♂). Upper surface with dense, \pm confluent dark spots *eximia* Rt. (Turkestan)

- 24 (23) Body more robust. Antennae thicker, 2nd joint usually considerably shorter 25
- 25 (26) Small species, length 3 mm. Tibiae with very small dark dots. Ocular index 1.19 (♂). 2nd antennal joint in ♂ about 1.14 x as long as diatone. Dark pattern dilute, rather uniformly and densely spread over all upper surface *arabica* Lv. (Arabia)
- 26 (25) Larger species, length > 3 mm. Tibiae with distinct dark spots . . . 27
- 27 (28) 2nd antennal joint about 1.3—1.35 x as long as diatone. Entire upper surface with abundant fuscous spotting and irroration; also apex of scutellum and cuneus distinctly ornate *maculosa* Rt. (Transcaspia, Iran)
- 28 (27) 2nd antennal joint 1.05—1.13 x as long as diatone. Apical part of scutellum and cuneus only indistinctly ornate with dark 29
- 29 (30) Larger and more robust species, length 3.5—3.75 mm. Ground colouring yellowish. Dark pattern of head faint, that of pronotum irregular, broken by pale irroration. 1st antennal joint with a reddish ring. Eyes of ♂ very large, ocular index 0.89—0.91 (♂), 1.7 (♀). 2nd antennal joint 1.05—1.09 x as long as diatone *oculata* Rt. (Transcaspia)
- 30 (29) Smaller species, length 3—3.2 mm. Ground colouring white. Head laterally dark brown, with irregular pale median band. Pronotum dark brown, with a contrasted pale longitudinal midline, the dark areas generally at most with indistinct pale irroration. 1st antennal joint more largely darkened. Eyes of ♂ smaller, ocular index 1.0—1.26 (♂), about 1.65 (♀). 2nd antennal joint 1.11—1.13 x as long as diatone *pentheus* n. sp. (Iran)
- A. macroptalma* Pop., unknown to me, is excluded of the key.

1. *A. astarte* n. sp.

Length 3.25 mm. Whitish yellow, with a faint reddish or yellowish tinge on pronotum, scutellum and elytra. Antennae yellow-brown. Elytra with traces of brownish dotting in clavus, median parts of corium and cuneus. Femora slightly tinged with reddish, tibiae pale yellowish, immaculate, spines delicate and pale.

Body robust, 2.7 x as long as broad. Hair covering concolorous. Head 0.86 x as broad as pronotum, seen in profile short, with tylus prominent, vertical; eyes very large, ocular index (♂) 0.92. Antennae moderately incrassate, proportions between joints 4:25:17:12, 2nd joint 1.11 x as long as diatone, 1.0 x as long as basal width of pronotum. Pronotum 2.3 x as broad as long, lateral margins slightly sinuated. Genitalia much as in *A. fuscumaculata*, but vesica (Fig. 2a) thicker.

Material studied: Israel, Eilat, 1 ♂, type and 1 ♂ paratype (my collection), 20. VI. 1958, LINNAVUORI.

The species is closely related to *A. fuscumaculata* in the pale immaculate tibiae, the shape of the vesica etc. It is easily distinguished, anyhow, by the absence of the fuscous spotting of the upper surface and the much larger eyes. In *A. fuscumaculata* the eyes are distinctly narrower than the vertex, ocular index 1.23 (♂) or 2.0 (♀). The 2nd antennal joint is 1.4 (♂) or 1.15 (♀) x as long as the diatone. The vesica (Fig. 2b) is narrower and dissimilarly curved. *A. astarte* was incorrectly recorded as *fuscumaculata* from Israel (LINNAVUORI 1961, p. 11).

2. *A. fuscomaculata* Rt.

Easily recognized in the characters mentioned in the key.

Material studied: Iran, Baluchistan, Iranshar, 800 m., 1 ex., 1.—10. III. 1954, RICHTER & SCHÄUFFELE, Mus. Stuttgart.

3. *A. suturalis* Rt.

Easily recognized in the characters mentioned in the key.

Material studied: Iran, Kerman, Anbar-Abad, some, 1.—18. V. 1956, RICHTER & SCHÄUFFELE. Iran, Baluchistan, Iranshar, 800 m., several, 1. III.—21. IV. 1954, RICHTER, Mus. Stuttgart and in my collection.

4. *A. arabica* Lv.

Recently described by me (LINNAVUORI 1962, p. 69—70). Easily recognized by the small size, length only 2.7—2.9 mm., and the dilute chocolate fuscous and sanguineous, not contrasted pattern of upper surface. The fuscous irregular spotting concentrated into anterior two-thirds of pronotum and the inner part of corium, inner basal angle of the latter with a larger irregular dark spot. Other parts of the upper surface with sanguineous irroration. Hind femora in apical half embrowned, other femora and tibiae with small red spots, spines pale.

Body 2.7 x as long as broad. Vertex slightly broader than eye, ocular index 1.19 (♂). 2nd antennal joint about 1.14 x as long as diatone, 0.87 x as long as basal width of pronotum.

Range: Only known from Saudi Arabia (El Riyadh).

Certainly closely related to *A. macrophthalma*, both species could even be conspecific. The original description of *A. macrophthalma* (POPPIUS 1909) contains, however, some details not fitting well with *A. arabica*. The pronotum, for instance, should have a longitudinal brown band on either side, the colour pattern of *macrophthalma* is compared with that of *vitticollis*. Moreover the eyes should be very large (compared with *A. oculata*), being somewhat broader than the vertex. Dr. H. SYNAVE has informed me in a letter that the type of *A. macrophthalma* does not exist in Mus. Brussels. Since it is in the Helsinki Museum neither, it seems to have been lost. A complete comparison between these two species is therefore not possible, until topotypic material of *A. macrophthalma* can be obtained.

5. *A. macrophthalma* Pop.

Found only from the type locality, Sahara, Bou Harmes.

6. *A. pentheus* n. sp.

Fig. 1 d. Length 3—3.2 mm. Upper surface of head dark brown, with irregular pale contrasted midline from tylus to base of vertex, the pale line, enlarging in base of vertex, provided sometimes with a few orangish or brownish spots; the dark sides sometimes broken by transverse pale arcs, in one specimen entire upper surface of head whitish yellow. Eyes dark brown. Antennae yellow-brown, tinged with orangish, 1st joint dark reddish. Pronotum dark brown, with a contrasted whitish yellow midline, the dark areas sometimes with pale irroration, in one specimen also lateral margins of pronotum pale. Base of scutellum dark brown, apical part

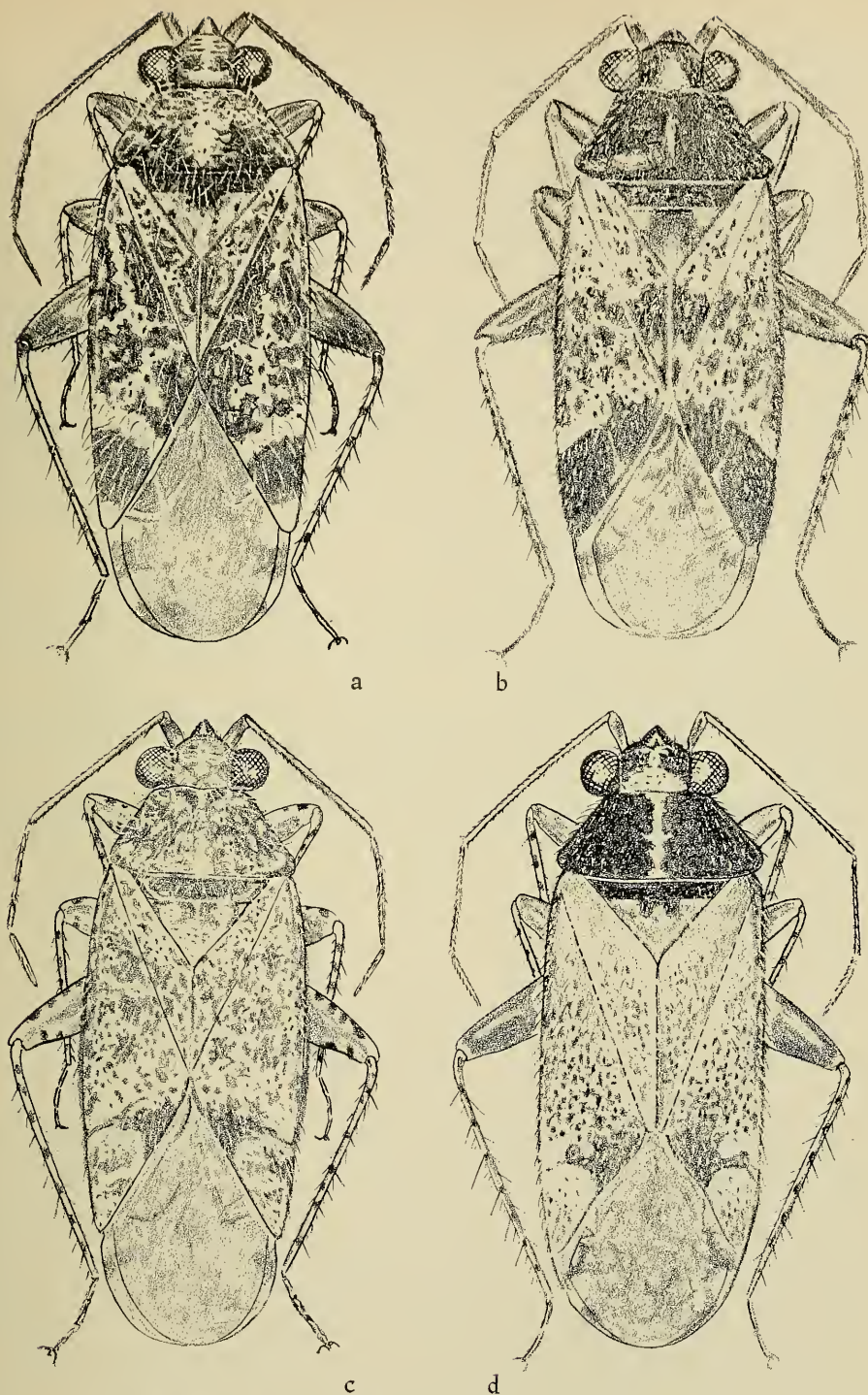


Fig. 1. *Atomophora pantherina* Rt. a, *A. nut* n. sp. b, *A. maculosa erato* n. ssp. c and *A. pentheus* n. sp. d. Drawn by FR. HELLER.

whitish yellow, colour differences contrasted. Elytra whitish, with \pm dense brown dotting and a few larger irregular spots of same colour; apical margin of corium with a large, rather contrasted dark brown spot; the dark markings often more sparse at base of corium and clavus, in the pale specimen, mentioned above, only the apical spot of corium and a few dots in cuneus present; membrane brownish smoky, with pale irroration, a larger pale spot in lateral margin, another pale spot at apex of cuneus, veins whitish or orangish. Under surface purplish or dark brown. Fore coxae pale. Fore and middle femora yellow-brown, \pm tinged with orangish apically, hind femora dark brown. Other parts of legs whitish yellow, tibiae with dark dots, spines pale.

Body about 2.7 x as long as broad. Hair covering yellowish and rather long. Head about 0.7 x as broad as pronotum, in profile 0.8 x as long as high, tylus rather strongly prominent, eyes large, ocular index 1.0–1.26 (σ^7) or 1.65 (ϕ). Antennae relatively incrassate (σ^7) or gracile (ϕ), proportions between joints 4:20:14:10 (σ^7) or 5:20:12:9 (ϕ), 2nd joint 1.11 (σ^7) or 1.13 (ϕ) x as long as diatone, about 0.8 x as long as basal width of pronotum. Rostrum to hind coxae. Pronotum 2.3–2.7 x as broad as long, lateral margins straight or slightly insinuated. Vesica (Fig. 2 c) relatively broad.

Material studied: Iran, Baluchistan, Iranshar, 800 m., 1 σ^7 , type and 6 paratypes, 11.–18. III. 1954, RICHTER & SCHÄUFFELE. Iran, Djiroft, Anbar-Abad, 1 paratype, 21.–30. IV. 1956, RICHTER. The holotype in coll. LINNAVUORI, paratypes in Mus. Stuttgart and in my collection.

The species is closely related to *A. oculata* Rt., but differs in the smaller size, the characteristic colour pattern, the considerably smaller eyes (σ^7) and the thicker vesica. The vesica of *A. oculata* is illustrated in Fig. 2 d.

A. pentheus was recorded as *A. pantherina* Rt. and *Atomophora* sp. near *vitticollis* Rt. by WAGNER (1957, p. 77 and 1958, p. 3).

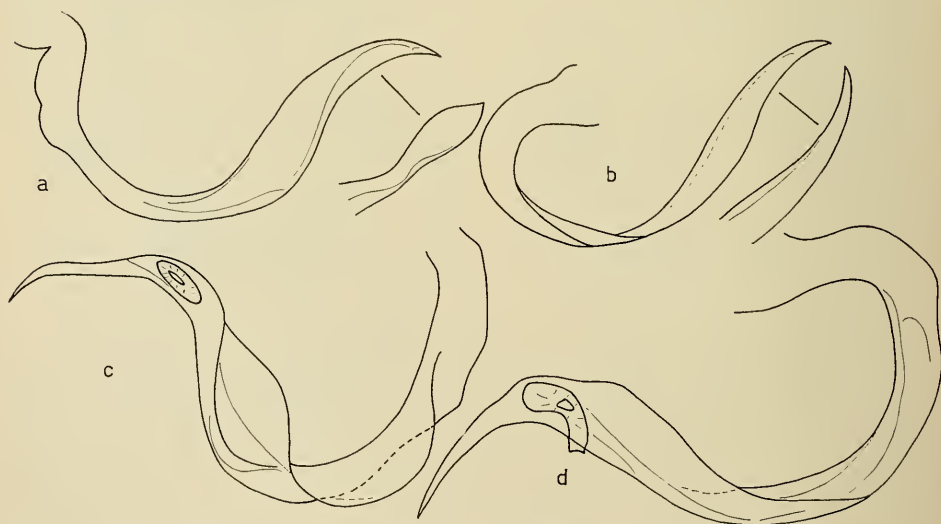


Fig. 2. Vesica of *Atomophora astarte* n. sp. a, *A. fuscomaculata* Rt. b, *A. pentheus* n. sp. c and *A. oculata* Rt. d.

7. *A. nut* n. sp.

Fig. 1 b. Length 3.5—3.75 mm. Head, pronotum and scutellum blackish or dark brown. Head with irregular pale ochraceous or reddish midline, broadest at base of vertex. Antennae yellow-brown, 1st joint dark brown or blackish, also base of 2nd joint darkened. Pronotum with a pale midline of various shape, sometimes very narrow and indistinct, sometimes enlarging at middle, then forming in some specimens a pale cruciate figure. Scutellum with tip and a small basal spot on either side, yellow-brown. Elytra pale greyish ochraceous or whitish grey, cuneus (save extreme apex) and inner apical angle of corium dark brown, the rest of corium and clavus with smaller and larger \pm confluent dark brown spots, the dark pattern most intense in apical two-thirds of corium, base rather pale, with only scanty dark markings. Membrane brownish smoky, with pale irroration, lateral margin with two larger pale spots, veins pale. Under surface dark brown. Legs yellow-brown, hind femora dark brown, also other femora \pm darkened apically, tibiae with distinct dark spots, spines pale, tarsi infumed.



Fig. 3. Vesica of *Atomophora nut* n. sp. a, *A. pantherina* Rt. b, *A. maculosa* Rt., nominate form from Ashabad d—e and *A. maculosa erato* n. ssp. f—g.

Body robust, ovate, 2.3—2.6 x as long as broad. Longish hair covering yellowish or greyish. Head 0.68—0.72 x as broad as pronotum, in profile somewhat shorter than high, tylus moderately prominent; eyes moderately large, narrower than vertex, ocular index 1.17 (σ^7) or 1.78 (ϕ). Antennae in σ^7 rather incrassate, in ϕ gracile, proportions between joints 5:22:15:9 (σ^7) or 5:19:13:8 (ϕ), 2nd joint 1.12—1.16 x as long as diatone, about 0.8 x as long as basal width of pronotum. Rostrum to middle coxae. Pronotum about twice as broad as long, lateral margins slightly sinuated. Vesica (Fig. 3a) thicker and more strongly curved than in *A. pantherina*.

Material studied, Algeria, Ain Sefra, 1 σ^7 , type and 3 $\phi\phi$ paratypes, 5.—6. V. 1964, ECKERLEIN, in my collection. Iran, Baluchistan, Iranshar, 800 m., 2 $\phi\phi$ paratypes, 11.—18. III. 1954, RICHTER & SCHÄUFFELE, in Mus. Stuttgart.

Host: *Calligonum comosum*.

Closely related to *A. pantherina* Rt. (incorrectly recorded as *pantherina* by WAGNER 1957, p. 77 and ECKERLEIN & WAGNER 1965, p. 217). The genuine *A. pantherina* (Fig. 1 a) is much narrower, about 3 x as long as broad. The colour pattern is different: The head is pale yellowish, with dark brown lateral arcs. The 1st and 2nd antennal joints are dark brown. The pronotum is pale greyish, with dark brown, \pm confluent spots and irroration, the pale colouring dominant. The scutellum is apically and laterally largely pale. The fuscous spots of the elytra are much larger and evenly spread throughout and the cuneus is both apically and basally white. The eyes are somewhat smaller, ocular index 1.33–1.36 (σ^7) or 2.0 (ϕ), and the 2nd antennal joint slightly longer, 1.18–1.19 x as long as diatone. The vesica (Fig. 3 b) is more slender and more shallowly curved.

8. *A. maculosa* Rt. ssp. *erato* n. ssp.

Fig. 1 c. Length 3.5 mm., breadth at base of pronotum 0.90–1.0 mm. Pale grey or greyish ochraceous. Entire upper surface with dense pattern of dark brown or red spots. Head with intensive brown and red markings, the pale ground colouring visible mainly only medially and at base of vertex. Antennae yellow-brown, 1st joint with subapical reddish ring. Pronotum densely marked with \pm confluent dark brown or reddish spots and irroration. Scutellum fuscous or reddish, with 3 irregular longitudinal pale bands. Elytra with evenly distributed, \pm confluent dense fuscous spots, inner apical angle of corium with a larger dark spot; membrane smoky, with faint pale irroration, veins whitish or partly reddish. Under surface yellow-brown, especially laterally marked with fuscous or sanguineous. Legs pale yellow-brown, fore and middle femora with a row of fuscous or red spots in ventral margin, hind femora densely spotted with same colour in apical half, tibiae with distinct dark spots, spines pale and long.

Elongately ovate. Hair covering long and pale. Eyes narrower than vertex, ocular index 1.21 (σ^7) or 1.9–2.1 (ϕ). Antennae long, proportions between joints 5:25:11:?
(σ^7) or 4:22:15:9 (ϕ), 2nd joint 1.4 (σ^7) or 1.22–1.26 (ϕ) x as long as diatone. Rostrum slightly beyond hind coxae. Lateral margins of pronotum faintly insinuated. Vesica in Fig. 3 f–g.

Material studied: Iran, Baluchistan, Iranshar, 800 m., 1 ϕ , type, in coll. LINNAVUORI, 28.–31. III. 1954, RICHTER & SCHÄUFFELE, 5 paratypes from the same locality in Mus. Stuttgart and my collection. Recorded as *A. pantherina* and *A. bipunctata* by WAGNER (1957, p. 77).

The nominate form from Transcaspia is considerably more robust, length 4 mm., breadth at base of pronotum 1.10–1.14 mm. The eyes in ϕ are somewhat larger, ocular index 1.15–1.24 (σ^7) or 1.51–1.83 (ϕ) and the 2nd antennal joint (ϕ) is slightly shorter, 1.25–1.42 (σ^7) or 1.31–1.35 (ϕ) x as long as diatone. The vesica in Fig. 3 d–e.

9. *A. subpallida* Wgn.

Recently described by WAGNER (ECKERLEIN & WAGNER 1965, p. 227–228 and WAGNER 1970, p. 64–66).

Easily recognized in the unusually small eyes, ocular index 1.65 (σ^7) or 2.55 (ϕ) and the scanty dark pattern.

Range: Algeria.

Species excluded

WAGNER (1970, p. 61—64) has recently proved that *Atomophora picticornis* Hv. belongs, in fact, to the genus *Yotvata* Lv. *Yotvata acacicola* (Lv.) is a synonym of *Y. picticornis* (Hv.).

Finally I want to express my sincerest thanks to Mr. FR. HELLER, of Stuttgart, for sending me interesting material of the genus for examination. I am also greatly indebted to him for the excellent illustrations of the new species.

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Zeitschrift/Journal: [Stuttgarter Beiträge Naturkunde Serie A \[Biologie\]](#)

Jahr/Year: 1971

Band/Volume: [229](#)

Autor(en)/Author(s): Linnavuori Rauno E.

Artikel/Article: [On the genus Atomophora Rt. \(Het. Miridae\). 1-9](#)