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Review of Iranian species of the genus *Tituboea* LACORDAIRE, 1848 (Coleoptera: Chrysomelidae)

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ABSTRACT. Identification key and check-list of Iranian species of the genus *Tituboea* are given. Two new species - *T. zarudnii* n. sp. and *T. pusilla* n. sp. - are described. Male genitalia of all species are illustrated.

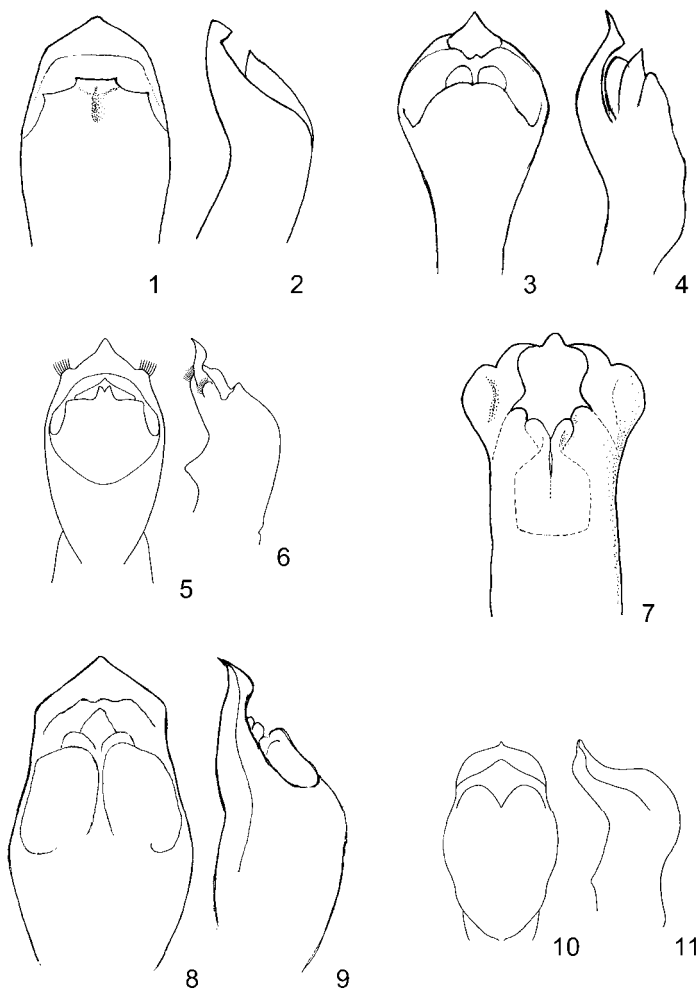
Key words: entomology, taxonomy, key, new species, *Coleoptera*, *Chrysomelidae*, *Tituboea*, Iran.

The Mediterranean genus *Tituboea* LACORDAIRE, 1848 (= *Antipa* auct.) comprises more than 35 species distributed from Morocco to Afghanistan; seven of them have been recorded from Iran hitherto (MEDVEDEV 1957, 1962; LOPATIN 1985). In the present paper 16 species are recorded from Iran, two of them being described new to the science. An identification key to all the Iranian species is given, with figures of male genitalia, and a check-list with province localities.

KEY TO SPECIES

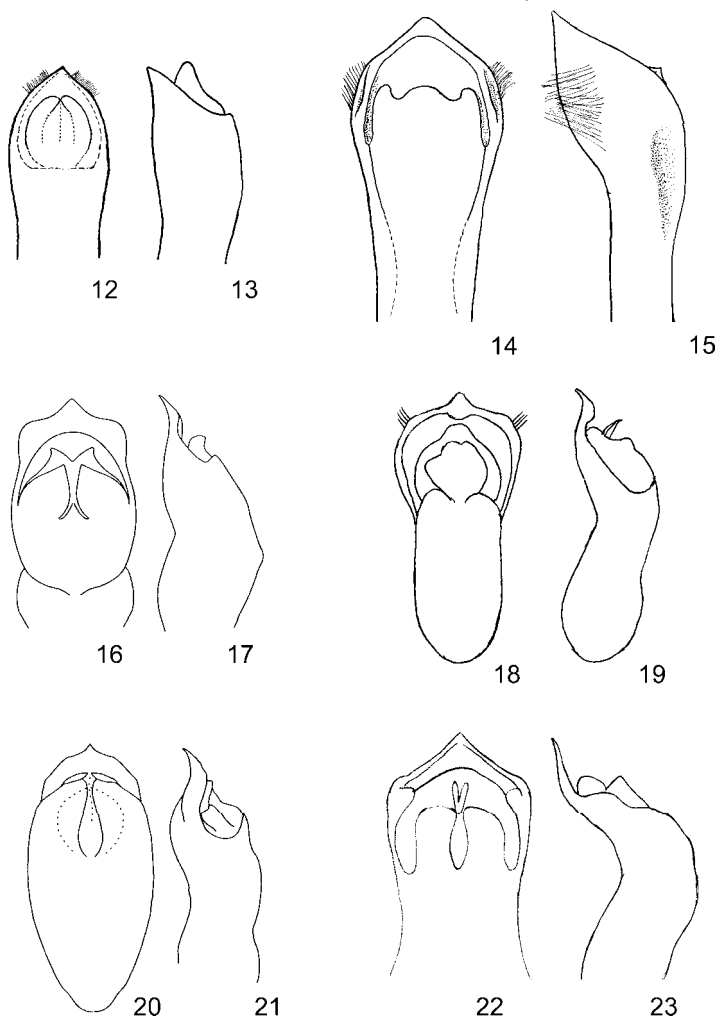
1. Posterior angles of pronotum elevated over the basis of elytra 2.
- . Posterior angles of pronotum not elevated over the basis of elytra 7.
2. Pronotum with black or dark brown spots 3.
- . Pronotum uniformly yellowish red 5.
3. Only frons between eyes black, vertex yellowish red 4.

- . Frons and vertex entirely black. Pronotal black spots moderately large, separate. Posterior pair of spots on elytra joined by a fine stripe. Apical part of aedeagus rounded laterally, its apical process forms an obtuse angle (fig. 1, 2). Length 5.3-5.5 mm *kermanica* MEDVEDEV.
4. Elytral puncturation rather shallow, distinct, tends to form longitudinal rows. Pronotum with two broadly separate, sometimes vanishing, pitch-brown spots. Pygidium orange-yellow. Apical 1/3 of aedeagus broadly rounded, apical process in lateral view thickened and bent ventrally (fig. 3, 4). Length 4 mm *ahwasa* LOPATIN.



1-11. Aedeagus: 1, 2 - *Tituboea kermanica*, 3, 4 - *T. ahwasa*, 5, 6 - *T. heptneri*, 7 - *T. silensis*, 8, 9 - *T. zarudnii*, 10, 11 - *T. nigriventris*; 1, 3, 5, 7, 8, 10 - dorsal, 2, 4, 6, 9, 11 - lateral; 1, 2, 5-7, 10, 11 - after MEDVEDEV, remainder orig.

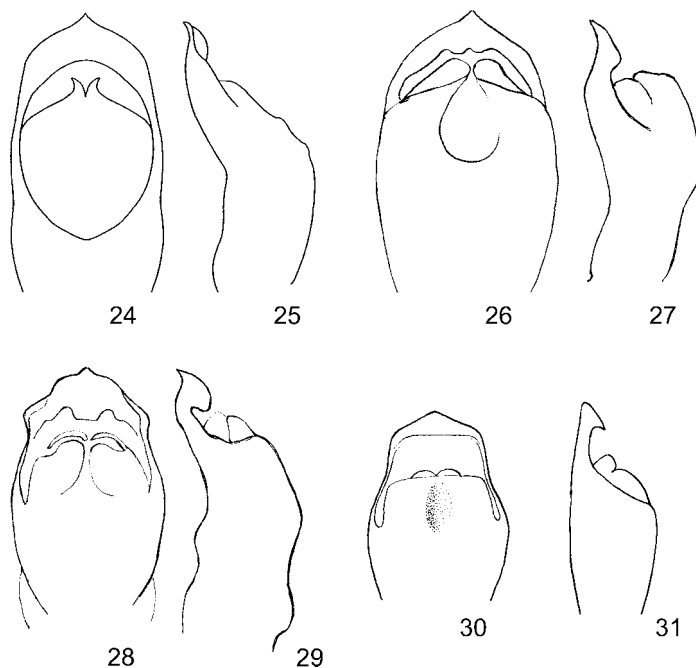
- . Elytra uniformly irregularly punctate. Pronotum at base with 2 great transverse spots. Pygidium black. Apex of aedeagus broadly truncate, with large, triangular apical process, lateral angles obtusely rounded with distinct, fine, short hairs (fig. 5, 6). Length 5.4-5.8 mm..... *heptneri* MEDVEDEV.
- 5. Elytra covered by short, erect hairs, well visible on slope. On each elytron a great black spot behind its midlength, small spot on humerus, and small spot on scutellum. In rare aberrations only humeral spot present. Apex of aedeagus crown-like (fig. 7). Length 5.5-8.4 mm *silensis* WEISE.
- . Elytra unpubescent 6.



12-23. Aedeagus: 12, 13 - *Tituboea iranica*, 14, 15 - *T. macropus*, 16, 17 - *T. rugulosa*, 18, 19 - *T. mirzayani*, 20, 21 - *T. ornaticollis*, 22, 23 - *T. arabica*; 12, 14, 16, 18, 20, 21 - dorsal, 13, 15, 17, 19, 21, 23 - lateral; 12-17, 20, 21 - after MEDVEDEV, remainder orig.

6. Each elytron with a transverse pair of small black spots in apical third. Last abdominal sternite and pygidium yellowish-orange. Apex of aedeagus triangular, apical process bent ventrally (fig. 8, 9). Length 5.6 mm *zarudnii* n. sp.
- Each elytron with four black spots, posterior pair often forms a transverse band. Abdomen and pygidium black. Apex of aedeagus broadly rounded with very small apical process (fig. 10, 11). Length 4.9-5.5 mm *nigriventris* LEFEVRE.
7. Pygidium black 8.
- Pygidium yellowish orange, rarely darkened basally 12.
8. Pronotum uniformly pale, at most with infusate line along the middle. Length 6-12 mm 9.
- Pronotum with black spots. Length 4.9-5.6 mm 10.
9. Elytral epipleura dull, densely covered by short hairs. Pronotum uniformly yellowish red or with a laterally blurred longitudinal median stripe, reaching to basal and anterior margins. Elytron yellow, behind middle with two spots. Apex of aedeagus triangular, with softly rounded sides, laterally with well-visible hairs, in lateral view not bent ventrad (fig. 12, 13). Length 6-7 mmn *iranica* MEDVEDEV.
- Elytral epipleura glabrous, only in anterior part with sparse hairs. Head, underside and tarsi black, sometimes also femora darkened. Each elytron with humeral spot and a broad transverse stripe in midlength, both of much variable size. Aedeagus long and slender, slightly widened before triangular apex, in lateral view distinctly bent ventrad (fig. 14, 15). Length 7.5-12.5 mm *macropus* ILLIGER.
10. Frons and vertex coarsely and rugosely punctate. Frontal impression shallow and broad. Elytra densely, coarsely and rugosely, pronotum densely and unevenly punctate. Black spots on the posterior part of pronotum very large, often coalescent and extending to anterior margin of pronotum. Each elytron with four black spots (2, 2), sometimes coalescent into transverse bands, rarely inner spots of anterior pair more or less obsolete. Aedeagus slightly widened in middle, constricted before apex, with triangular apical process (fig. 16, 17). Length 4.9-5.5 mm *rugulosa* WEISE.
- Vertex smooth or very finely punctate. Frontal impression distinct, more or less densely punctate. Puncturation of elytra, at least in basal part, not coarse or rugose 11.
11. Pronotum unevenly punctate, with 2 large black spots basally. Scutellum and four very large, transversally coalescent spots (2, 2) on each elytron black. Legs entirely yellowish red. Aedeagus strongly widened apically, its anterior margin with a great, ventrally bent, triangular apical process (fig. 18, 19). Length 5.3-5.4 mm *mirzayani* LOPATIN.
- Pronotum uniformly, evenly, distinctly but finely punctate. Mid- and hind femora mostly pitchy black. Elytral pattern as in *rugulosa*, but anterior pair of spots never coalescent and the inner spot often more or less obsolete. Aedeagus

- in mid part widened, triangular apical process only slightly bent ventrad (fig. 21, 22). Length 5.5-5.6 mm *ornaticollis* MEDVEDEV.
12. Larger species. Body length in male 7.5-9.5 mm, in female 4.2-5.3 mm 13.
- Smaller, length in male 3.5-5.3 mm, in female 4.2-5.3 mm. Three very similar species, whose correct identification is possible only based on male genitalia 14.
13. Head uniformly yellowish red. Body broad and robust. Elytra coarsely and deeply punctate. Pronotum and scutellum yellow-orange. Each elytron with four black spots (2, 2) in two transverse rows. Abdomen yellowish red with black spots on sides of four anterior sternites. Apex of aedeagus triangular, operculum with small, forked process (fig. 22, 23). Length 7-9.5 mm *arabica* OLIVIER.
- Frons and vertex black. Body elongate. Scutellum black, usually with yellowish apex. Pronotum uniformly yellowish red or with 2-4 black spots in basal half. Each elytron with 4 black spots; anterior pair smaller and sometimes obsolete. Posterior pair situated obliquely, sometimes fused into a band, never extending to suture nor to lateral margin of elytron. Abdomen black, last sternite and pygidium sometimes yellowish red. Apex of aedeagus (fig. 28, 29) rounded at sides, with a sharp, triangular apical process. Length 5.5-6.5 mm *puncticollis* MEDVEDEV.



24-31. Aedeagus: 24, 25 - *Tituboea puncticollis*, 26, 27 - *T. pusilla*, 28, 29 - *T. rufopygus*, 30, 31 - *T. affinis*; 24, 26, 28, 30 - dorsal, 25, 27, 29, 31 - lateral; 24, 25, 30, 31 - after MEDVEDEV, remainder orig.

14. Apex of aedeagus in lateral view forms a strongly bent dorsally tooth (figs 28, 30) 15.
- Apex of aedeagus in lateral view forms a softly bent dorsally tooth (fig. 26, 27). Body small and slimmer. Elytra 2.8-3.5× longer than pronotum. Frons uniformly yellowish-red or with two small, sometimes enlarged and coalescent black spots between the eyes. On each elytron two small, black spots in 1/4 anterior length, and a transverse band behind middle. Sometimes anterior spots absent and posterior band divided into two spots. Length 3.5-5 mm *pusilla* n. sp.
15. Apical part of aedeagus brace-like, constricted behind apex, in lateral view beak-shaped (fig. 28, 29). Punctuation of pronotum double, coarser punctures form before scutellum two much densely punctate areas before scutellum. Upperside reddish yellow, pronotum darker, between eyes dark transverse band, elytra with a black pattern: two spots at base of pronotum, small spot behind humerus, and transverse, emarginate anteriorly, band behind middle, not extending to suture nor lateral margin of elytra. Spots on pronotum and small spot behind humerus sometimes obsolete. Frons, vertex, and fore coxae sometimes blackish. Length 4.8-5.3 mm *rufopygus* LOPATIN.
- Apex of aedeagus triangular (fig. 30, 31). Pronotum finely and sparsely punctate. Upperside yellowish-orange; frons black, each elytron with three black spots (1 on humerus and 2 behind the middle), sometimes also an additional spot on scutellum. Length 4.4-5.3 mm *affinis* MEDVEDEV.

DESCRIPTIONS OF NEW SPECIES

Tituboea zarudnii n. sp.

TERRA TYPICA

South-western Iran.

ETYMOLOGY

Species dedicated to the famous researcher of the Iranian fauna, N. ZARUDNY.

DESCRIPTION

Male. Length 5.6 mm, width of elytra in the humeral part 2.7 mm. Upperside and legs yellowish red, a small spot on frons, scutellum (except apex), two rather small, transversally situated spots behind middle of each elytron, thorax and abdomen black; last abdominal sternite and pygidium yellowish red. Antennomeres 6-11 slightly darkened.

Frons between eyes broadly but shallowly impressed, densely punctate, covered by short adherent hairs. Anterior margin of clypeus emarginate. Anten-

nae short, reaching midlength of lateral margin of pronotum; segment 4 transverse.

Pronotum $1.68\times$ wider than long, glabrous, finely and rather densely punctate. Anterior angles almost rectangular, posterior angles broadly rounded and slightly elevated over the basis of elytra. Lateral sides with fairly broad and slightly thickened marginal ridge. Scutellum smooth, its apex elevated.

Elytra $2.6\times$ longer than pronotum and $1.5\times$ longer than broad in humeral part, in the middle slightly constricted; stronger and much deeper punctate than pronotum, only on slope puncturation sparse; interstices narrow, convex.

Underside and pygidium slightly glabrous, covered by fine, short hairs. Fore tibiae slightly bent, not longer than femora. Apex of aedeagus triangular (fig. 8, 9).

The species is similar to *T. nigriventris* LEF., but differs in the form of aedeagus, yellowish red coloured pygidium and two black spots behind the middle of each elytron.

MATERIAL EXAMINED

Holotypus: Iran, Bachtari reg., ruins of Kale-Mardese, 3.IV.1904, 1 male, leg. N. ZARUDNY (preserved at the Department of Zoology, Belorussian State University, Minsk, Belarus).

Tituboea pusilla n. sp.

TERRA TYPICA

Iran, Kerman prov.

ETYMOLOGY

Lat. *pusillus* means small, little, after its small size.

DESCRIPTION

Male. Length of body 4.2 mm, breadth of elytra in the humeral part 2 mm. Head and pronotum yellowish red, elytra and legs yellow. Frons with two small black spots, on each elytron two spots basally and a transversal stripe behind middle. Antennae yellow, antennomeres 5-11 slightly darkened. Meso- and metasternum, like the ventral side of abdomen, pitchy-black, last abdominal sternite and pygidium yellowish red.

Frons between eyes square-like impressed, densely punctate and covered by short, adpressed, hairs near eyes more densely distributed. Anterior margin of clypeus shallowly emarginate. Antennae short, antennomere 4 triangular.

Pronotum $1.7\times$ broader than long, shining, on the disc smooth, laterally very finely and loosely punctulate. Posterior angles not elevated over basal part of elytra. Scutellum in posterior half narrow and smooth, its apex rounded.

Elytra 2.8× longer than pronotum and 1.5× longer than broad, behind 1/3 length slightly constricted, randomly and unevenly punctate. interstices as broad as diameter of punctures or slightly broader.

Underside densely covered by fine hairs. Pygidium very densely and finely punctate, also densely covered by short hairs. Fore legs lengthened, tibiae slightly bent. Apex of aedeagus (fig. 26, 27) triangular, with a small tooth.

Female. Length of body 3.5-5 mm. Spots behind the middle of elytra sometimes joined. Scutellum black, rarely its apex yellowish red.

T. pusilla, externally very similar to numerous other Iranian species of *Tituboea*, differs in the form of aedeagus.

MATERIAL EXAMINED

Iran, prov. Kerman, Sabzevaran, 17.V.1977, 2 specimens: holotypus (male) and paratypus (female); north of Espakeh, 11.IV.1973, 1 paratypus (female); prov. Hormozgan, mountains Kuh-e-Genu, 400-600m, 1.IV.1977, 1 paratypus (male). Types preserved at the Department of Zoology, Belorussian State University, Minsk, Belarus.

CHECK-LIST OF IRANIAN *TITUBOEA*

- affinis* L. MEDVEDEV, 1957. Beitr. zur Entom., **7**, 3/4: 330 NE Iran: Khurasan.
ahwasa LOPATIN, 1985. Etom. Obozr., **64**, 4: 761. SW Iran: Khuzistan.
arabica OLIVIER, 1808. Entomologie, Col., **6**: 860 (*Clytra*). Iran: Kurdistan, Isfahan, Hormuzgan, Kerman, Baluchistan. Jordan, Egypt, Saudi Arabia.
heptneri L. MEDVEDEV, 1957. Beitr. zur Entom., **7**, 3/4: 329 NE Iran: Isfahan.
iranica L. MEDVEDEV, 1957. Beitr. zur Entom., **7**, 3/4: 326. NE Iran: Kerman.
kermanica L. MEDVEDEV, 1962. Etom. Obozr., **41**, 3: 619 (*Antipa*). NE Iran: Kerman.
macropus ILLIGER, 1800. Wiedem. Arch. zool., **1**, 2: 128 (*Antipus*). W Iran, Teheran. S. and SE Europe, Asia Minor, Israel, Syria, Centr. Asia (Turkmenistan, Uzbekistan).
mirzayani LOPATIN, 1985. Entom. Obozr., **64**, 4: 763 (*Antipa*). Iran: Fars.
nigriventris LEFÈVRE, 1872. Ann. Soc. ent. Fr., sér. 5, **2**: 136. Iran: Mazandaran. Central Asia.
ogloblini L. MEDVEDEV, 1962. Etom. Obozr., **41**, 3: 623 (*Antipa*). Iran (?). Israel, Yemen, Oman, Saudi Arabia.
ornaticollis L. MEDVEDEV, 1957. Beitr. zur Entom., **7**, 3/4: 328. Iran: Kerman, Baluchistan, Sistán.
puncticollis L. MEDVEDEV, 1962. Etom. Obozr., **41**, 3: 622 (*Antipa*). Iran: Khurasan. Turkmenistan.
pusilla spec. nov. Iran: Kerman, Hormuzgan.
rufopygus LOPATIN, 1985. Etom. Obozr., **64**, 4: 761. Iran: Fars.

rugulosa WEISE, 1898. Arch. für Naturg., **64**: 183. Iran: Kerman, Baluchistan. Transcaucasus.

silensis WEISE, 1894, Dtsch. ent. Ztschr., 1894, 1: 70. Iran: Kerman. Central Asia.

zarudnii spec. nov. SW Iran: Bakhtiar.

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- , 1962. Review of leaf beetles of the genus *Antipa* (*Coleoptera, Chrysomelidae*) of the fauna of the USSR and contiguous countries. Ent. Obozr., **41**, 3: 613-624 (in Russian).