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**Species of *Spalangia* LATREILLE, 1805
(Hymenoptera: Pteromalidae, Spalangiinae)
from Turkey, with descriptions of new species**

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Abstract

The species of *Spalangia* LATREILLE, 1805 (Hymenoptera: Pteromalidae, Spalangiinae) from Turkey were studied. From Turkey 10 species of *Spalangia*, two of them as new species, *Spalangia kocakeri* nov.sp., *S. marashensis* nov.sp. and male of *S. slovak* BOUČEK were described, 6 species, *S. endius* WALKER, 1839, *S. nigroaenea* CURTIS, 1839, *S. slovak* BOUČEK, 1963, *S. rugulosa* FÖRSTER, 1850, *S. irregularis* BOUČEK, 1963, *S. erythromera* FÖRSTER, 1850, as new record for Turkey, and two species, *S. subpunctata* FÖRSTER, 1850, *S. fuscipes* NEES, 1834, were recorded from several parts of Turkey. An identification key was provided for the Turkish species.

Key words: *Spalangia* spp., Hymenoptera, Pteromalidae, Turkey.

Zusammenfassung

Vorliegende Arbeit behandelt das Vorkommen der Gattung *Spalangia* LATREILLE, 1805 (Hymenoptera: Pteromalidae, Spalangiinae) in der Türkei. Es gelang der Nachweis von 10 Arten, wobei *Spalangia kocakeri* nov.sp., *S. marashensis* nov.sp. sowie das Männchen von *S. slovak* BOUČEK neu beschrieben wurden. *S. endius* WALKER, 1839, *S. nigroaenea* CURTIS, 1839, *S. slovak* BOUČEK, 1963, *S. rugulosa* FÖRSTER, 1850, *S. irregularis* BOUČEK, 1963 sowie *S. erythromera* FÖRSTER, 1850 sind Erstnachweise für die Türkei. Zudem wird ein Bestimmungsschlüssel für die türkischen Arten vorgestellt.

Introduction

The genus *Spalangia* was described by LATREILLE (1805) having *Spalangia nigra* LATREILLE, by monotypy. GIBSON (2009) and NOYES (2016) recorded *Spalangia* as valid genus in the subfamily Spalangiinae (Pteromalidae), and recorded 21 species, from Palearctic region. The first revision and an identification key of the world species of *Spalangia* was provided by BOUČEK (1963). Later, an identification key for the palearctic species was provided and the species were listed by GRAHAM (1969).

From Turkey, only two species, *Spalangia fuscipes* NEES (BOUČEK 1963; ÖNCÜER 1991; ANDRIESCU & MITROIU 2001; THUROCZY & O'CONNOR 2009) and *Spalangia subpunctata* FÖRSTER (DOĞANLAR 1985; ÖNCÜER 1991), were recorded.

Host records of the species of *Spalangia* have been given as many species of several families in Diptera and Hymenoptera (BOUČEK 1963, GRAHAM 1969, GIBSON 2009 and NOYES 2016).

In this work morphological characters of the *Spalangia* species from Turkey were studied and the new species were described and compared with the similar species and an identification key was provided for the Turkish species.

Material and Methods

This study is based upon examination and identification of the specimens collected from several parts of Turkey. The examined specimens and types of the new species were deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC). Specimens were collected by sweeping net and putting the whole contents of the swept materials directly in 96 % ethanol. After sorting the material, individuals were mounted on cards for further morphological studies.

The species were identified by following the keys of BOUČEK (1963), GRAHAM (1969) and GIBSON (2009). Wings and antennae of the holotypes were slide-mounted in Canada balsam. Photographs of diagnostic characters of the genera were taken by using of Leica DM 500 microscopes with a digital Leica ICC 50 camera attached to it.

Terminology and abbreviations

Morphological terminology follows GIBSON (2009). Abbreviations used in the key and descriptions are:

OOL= shorter distance between ocello-ocular line,

POL= distance between posterior ocelli,

F1-7 = funicular segments.

Results and Discussion

Spalangia LATREILLE, 1805

Spalangia LATREILLE, 1805: 227-228. Type species: *Spalangia nigra* LATREILLE, by monotypy.

Prospalangia BRÉTHES, 1915: 314. Type species: *Prospalangia platensis* BRÉTHES, by original designation.

Diagnostic characters: Head, pronotal collar and/or mesonotum usually with some setiferous punctures or crenulae, but if not then mostly smooth and shiny with short, sparse setae. Head with occipital carina, at least dorsally; lower face often acutely angled under torulus so in lateral view torulus appears to be at apex of short tube extending beyond level of base of mandible. Maxillary and labial palpi 2-segmented. Wings fully developed, bare or variably densely setose behind submarginal vein but usually obviously less setose than disc. Mesopleuron with variably sculptured subalar scrobe, episternal scrobe/line and precoxal scrobe/line differentiating upper and lower mesepimeron from upper mesepisternum posterior to acropleuron and pectal region; pectal region with at least 1 seta postero-ventrally; upper and lower mesepisternum usually differentiated by transepisternal line and/or variable number of setae in line anterior to mesocoxa. Propodeum with paramedian crenulate furrows. Petiole much longer than wide, longitudinally carinate-strigose to reticulate-rugose, and with acutely pointed anterolateral angles directed anteriorly so as to form W-like depression for posterolateral margins of propodeal foramen. Metasoma with tergites strongly sclerotized, often flattened but not collapsed in air dried specimens, and with comparatively inconspicuous, sparse setae dorsally; first tergite of metasoma deeply, uniformly concave anteriorly with depressed region carinately margined laterally, and third tergite of metasoma usually conspicuously larger than second and fourth ones (GIBSON 2009).

Up to now 21 Palearctic species were listed by NOYES (2016).

Key to species of *Spalangia* LATREILLE of Turkey (Based on the key of BOUČEK, 1963)

- 1 Male: Body (Fig. 1a) (head slightly) strongly depressed, flattened, 2.0 mm in length; mesosoma 3.8x as long as its depth; scutellum (Fig. 1d) with cross-line indicated only by one or two punctures laterally; head (Fig. 1a, b) in profile about 1.8x as long as thick; antenna (Fig. 1e) slender, filiform, flagellum (antenna less scape) 0.54x as long as stretched head plus thorax (40:74), sparsely hairy, hairs about 1/3 width of segment in question; scape 1.2x as long as the globular pedicel plus F1, which is nearly 1.5x as long as the pedicel and about 1.9x as long as broad; the following segments almost equal in size, F2-F7 almost 1.13x as long as wide; clava slightly longer than preceding two segments combined (as 23:20). Linear sensillae (Fig. 1f) on F1 in 5 rows and F2-F4 in 2-3 rows. Abdominal (Fig. 1h) petiole almost 1.67x as long as broad *S. kocakeri* nov.sp.
- Body (Fig. 2a, 3a) not extraordinarily flattened, usually longer; mesosoma about twice as long as its depth. scutellum with or without cross-line; other characters variable..... 2

- 2 Pronotum with an isolated crenulate cross-line consisting of close punctures in front of hind margin; disc of collar more or less smooth, impunctate..... 3
- Pronotum without an isolated crenulate cross-line; other characters variable 5
- 3 Pronotal collar (Figs 134, 135 of GIBSON (2009) rounded off anteriorly, without any distinct ridge; antero-lateral parts of collar umbilicately punctate, with wide or narrow smooth interspaces; collar semiglobose, vaulted, with cross-line often subangularly curved; umbilicate punctures sparse and rather regularly scattered, mostly large; distal funicle segments in female slightly transverse, in male quadrate.....
..... *S. endius* WALKER
- Pronotal collar (Figs 351-353 of GIBSON 2009) bordered anteriorly by a narrow groove setting off the ridge-like margin 4
- 4 Collar subpentagonal, nearly plain between ridge and cross-line, collar between ridge and cross-line about 1.94x as broad as long; in female all funicle segments mostly oblong and gena longer than eye length, head also oblong. In male: antenna (Fig. 358 of GIBSON 2009) with scape as long as the globular pedicel plus F1, plus F2; F1 nearly 2.5x as long as the pedicel and 3.5x as long as broad; F2-F7 almost 2x as long as wide; clava 2.7x as long as broad, and 1.9x as long as F7. Abdominal (Fig. 356 of GIBSON 2009) petiole almost 2.3x as long as broad.....*S. nigroaenea* CURTIS
- Male: head (Figs 2a,b) almost as long as broad; gena shorter than eye length; collar (Fig. 2e) between ridge and cross-line about twice as broad as long, distinctly arched; mesoscutum 2.27x as broad as long; antenna (Figs 2c,d) with scape as long as the globular pedicel plus F1,F2 plus 1/2 F3; F1 is nearly 1.86x as long as the pedicel and about 2.2x as long as broad; the following segments almost equal in size, F2-F7 almost 1.83x as long as wide; clava 3.17x as long as broad, and 1.73x as long as F7. Abdominal (Fig. 2f) petiole almost 2.0x as long as broad
..... *S. slovakia* BOUČEK
- 5 Pronotum and head (Figs 320-321 of GIBSON 2009) very densely punctate, or rugoso punctate, interspaces much narrower than punctures themselves 6
- Pronotum and head (Figs 3b,d; Fig. 152 of GIBSON 2009) very sparsely punctate, or sometimes with partial longitudinal rugosity in a cross-band..... 7
- 6 Puncturations on head and pronotum (Figs 320-321 of GIBSON 2009) crowded irregularly usually without any interspaces; antennal scape (Figs 325-326 of GIBSON 2009) dull, granulate *S. rugulosa* FÖRSTER
- Puncturations on head not crowded with distinct smooth interspaces; pronotum (Figs 322 of GIBSON 2009) crowdedly, very irregularly rugoso-punctate; interspaces indistinct, scape (Figs 323-324 of GIBSON 2009) finely granulated on outer side, subglabrous on the inner *S. irregularis* BOUČEK
- 7 Male antenna (Figs 3a,c) with F1 almost quadrate, and equal to other funicular segments; female antenna (Figs 3i,j) with flagellum distinctly widening towards tip; flagellum (antenna less scape) 0.63x as long as stretched head plus mesosoma (50:80); scape as long as pedicel plus F1-F6 combined; pedicel 2x as long as width; F1 is nearly 0.4x as long as the pedicel, as long as broad; the following segments almost equal in size, F2-F7 distinctly transverse, F2 1.67x, F7 1.63x as wide as long; clava 1.76x as long as broad, and 3.75x as long as F7. Linear sensillae on F1-F7 sparse, in one row, on clava very sparse, with 4 rows. Metasoma 1.2x as long as head plus mesosoma..... *S. marashensis* nov.sp.

- Male antenna (Fig. 1 e; Figs 2c,d) with F1 distinctly longer than width, and longer than other funicular segments..... 8
- 8 Scutellum (Figs 153-155 of GIBSON 2009) with a developed frenal line; head sometimes with distinct punctures on upper face but not on gena (Fig. 152 of GIBSON 2009), and at most finely coriaceous within scrobes; tarsi often distinctly yellowish.....*S. erythromera* FÖRSTER
- Scutellum with the frenal line weak or lacking; head without distinct punctures on upper face, and smooth within scrobes; tarsi mostly black or brown 9
- 9 Forewing (Fig. 193, 194 of GIBSON 2009) with up to 7 setae on mediocubital fold and with setae in basal cell extending proximally at most to level of most distal seta on mediocubital fold; funicle (Fig. 444 of GIBSON 2009) usually with at least F2 and sometimes all except apical segments quadrate to oblong; petiole with at most 1 seta
..... *S. subpunctata* FÖRSTER
- Forewing (Fig. 191, 192 of GIBSON 2009) with at least 7 setae on mediocubital fold and with setae in basal cell extending proximally obviously beyond level of most distal seta of mediocubital fold; funicle (Figs 187, 189 of GIBSON 2009) with F2 and all subsequent segments obviously transverse; petiole with 2 or more setae.....
..... *S. fuscipes* NEES

***Spalangia kocakeri* nov.sp.** (Figs 1a-h)

M a t e r i a l s t u d i e d : Holotype male, Turkey: Tokat, Taşlıçiftlik, 04.vii.1989, swept from pasture, H.Çam, deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC).

E t y m o l o g y . The name is derived from the name of my friend Mr. Seyit Koçaker, who helped to me during collecting Chalcidoidea in Tokat.

D e s c r i p t i o n . Male: Body 2.0 mm in length. Body black, tarsi brown, except fore tarsi paler; Body (Fig. 1a) (head slightly) strongly depressed, flattened; head (Fig. 1b) in anterior view about 1.1x as high as wide; in dorsal view about 2.23x as wide as long; in lateral view about 1.8x as long as thick, with malar space about 0.6x as long as eye height and about 1.8x as eye width. Head capsule smooth and shiny, with some scattered piliferous punctures, median sulcus extending ventrally to level of lower orbit, scrobal depression almost as long as broad, with fine reticulations. Antenna (Fig. 1e, f) slender, filiform, flagellum (antenna less scape) 0.54x as long as stretched head plus thorax (40:74), sparsely hairy, hairs about 1/3 width of segment in question; scape 1.2x as long as the globular pedicel plus F1, which is nearly 1.5x as long as the pedicel and about 1.9x as long as broad; the following segments almost equal in size, F2-F7 almost 1.13x as long as wide; clava slightly longer than preceding two segments combined (as 23:20). Linear sensillae (Fig. 1f) on F1 in 5 rows and F2-F4 in 2-3 rows.

Mesosoma 3.8x as long as its depth. Pronotum (Fig. 1 c) without cross-line posteriorly, collar in lateral view straight behind neck, immargined, slightly convex, with fine reticulation, collar separated by distinct, arched cross-groove; disc about 1.5x as broad as long, with scattered broad and shallow punctures, except at median line. Mesoprescutum (Fig. 1c) on disc with irregular piliferous longitudinal punctures along median line, smooth and shiny except for setae near notauli. Scutellum (Fig. 1d) smooth, slightly convex, with cross-line indicated only by a few shallow punctures laterally. Propodeum (Fig. 1d) with median carina parallel sided into a lanceolate smooth area between

narrow, finely crenulate grooves, these containing up to posterior third; plicae indistinct, spiracular sulci narrow, postero-lateral corner blunted. Forewing (Fig. 1g) with speculum almost closed, narrow; basal cell bare, closed; behind submarginal vein with a few setae. Abdominal petiole (Fig. 1h) almost 1.67x as long as broad, longitudinally carinate; bare. Metasoma smooth and shiny.

Female: unknown.



Fig. 1. *Spalangia kocakeri* nov.sp. Male. (a) body; (b) head in frontal view; (c) pronotum and mesoscutum; (d) Scutellum and propodeum; (e) antenna; (f) basal segments of flagellum with linear sensillae; (g) forewing; (h) petiole and metasoma. (Scale bar for a, c= 0.5 mm; for b= 0.35 mm; for d,h= 0.6 mm; for e= 0.94 mm; for f= 0.21 mm; for g= 0.44 mm).

Comments: *Spalangia kocakeri* nov.sp. is similar to *Spalangia drosophilae* ASHMEAD in having body (head slightly) strongly depressed, flattened, 2.0 mm in length; scutellum with cross-line indicated only by one or two punctures laterally. But the new species differs *S. drosophilae* in having male antenna with flagellum (antenna less scape) 0.54x as long as stretched head plus thorax (40:74), sparsely hairy, hairs about 1/3 width of segment in question; scape 1.2x as long as the globular pedicel plus F1, which is nearly 1.5x as long as the pedicel and about 1.9x as long as broad; the following segments almost equal in size, F2-F7 almost 1.13x as long as wide, and abdominal

petiole almost 1.67x as long as broad (in *S. drosophilae* having male antenna with flagellum (antenna less scape) nearly as long as stretched head plus thorax (40:42), densely hairy, hairs almost as long as width of the segment in question; scape hardly as long as the globular pedicel plus F1, which is nearly 5x as long as the pedicel and about 6x as long as broad; the following segments slightly increasing in length, F2 2x, F7 almost 3x as long as wide, and abdominal petiole almost 2x as long as broad).

***Spalangia endius* WALKER, 1839**

Spalangia endius WALKER, 1839: 96; holotype ♂ (BMNH). Type data: [Chile], James's Isle.

The synonyms, description, distribution and hosts were given by BOUČEK (1963) and GIBSON (2009).

M a t e r i a l s t u d i e d : Turkey, 1♂, Adana, Kiliseköy, 13.ix.2006, swept from pasture, M. Doğanlar. **New record for Turkey.**

D i a g n o s t i c c h a r a c t e r s : Pronotum with an isolated crenulate cross-line consisting of close punctures in front of hind margin; disc of collar more or less smooth, impunctate; pronotal collar rounded off anteriorly, without any distinct ridge; antero-lateral parts of collar umbilicately punctate, with wide or narrow smooth interspaces; collar semiglobose, vaulted, with cross-line often sub-angularly curved; umbilicate punctures sparse and rather regularly scattered, mostly large; distal funicle segments in female slightly transverse, in male quadrate.

***Spalangia nigroaenea* CURTIS, 1839**

Spalangia nigroaenea CURTIS, 1839: folio 740; holotype ♂ (ANIC, not examined). Type data: [England], in Mr. Shuckard's collection.

The synonyms, description, distribution and hosts were given by BOUČEK (1963) and GIBSON (2009).

M a t e r i a l s t u d i e d : Turkey, 2♀♀, 3♂♂, Hatay, Antakya, June 2000, reared from pupae of *Musca domestica* L., M. Doğanlar; 1♂, Hatay, Antakya, Hacipaşa, 25.vi.1993, swept from pasture, M. Doğanlar. **New record for Turkey.**

D i a g n o s t i c c h a r a c t e r s : Collar subpentagonal, nearly plain between ridge and cross-line, collar between ridge and cross-line about 1.94x as broad as long; in female all funicle segments mostly oblong and gena longer than eye length, head also oblong. In male: antenna with scape as long as the globular pedicel plus F1, plus F2; F1 nearly 2.5x as long as the pedicel and 3.5x as long as broad; F2-F7 almost 2x as long as wide; clava 2.7x as long as broad, and 1.9x as long as F7. Abdominal petiole almost 2.3x as long as broad

***Spalangia slovaca* BOUČEK, 1963 (Figs 2a-g)**

Spalangia slovaca BOUČEK, 1963: 453, holotype♀, and Paratype, 1♀, deposited in the Entomology Department, National Museum, Prague, No. 25402.

M a t e r i a l s t u d i e d : Turkey, 1♂, Adana, Center, 15.v.1980, swept from pasture, A. Beyarslan, deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC).

Up to now the male of *S. slovakia* has not be found. The male described below is found from Adana, its many characters fit the ones were given for females by BOUČEK (1963). Description of male as follows:

Male: Body and legs black, apical 1/6 of tibiae and tarsi yellow, except last segment of tarsi brown; Body (Fig. 2a) about 5x as long as depth of mesosoma; Head (Figs 2a,b) umbilicately punctate, with interspaces as broad as punctures, densely hairy, in facial view almost as long as broad; median sulcus indistinct, extending about to mid way of orbit, scrobal area with fine reticulations; in anterior view about 1.1x as high as wide; in dorsal view about 2.2x as wide as long; in lateral view about 1.7x as long as thick, with malar space about 0.55x as long as eye height and about 1.2x as eye width. Antenna (Figs 2c,d) slender, filiform, flagellum (antenna less scape) as long as stretched head plus thorax (43:40), sparsely hairy, hairs about 1/4 width of segment in question; scape as long as the globular pedicel plus F1, F2 plus 1/2 F3; F1 is nearly 1.86x as long as the pedicel and about 2.2x as long as broad; the following segments almost equal in size, F2-F7 almost 1.83x as long as wide; clava 3.17x as long as broad, and 1.73x as long as F7. Linear sensillae (Fig. 2d) on F1 in 5 rows and F2-F7 in 3-4 rows, on clava indistinct.

Pronotum (Fig. 2e) with deep crenulate cross-line posteriorly, parallel to smooth hind margin; collar in lateral view straight behind neck, immargined, slightly convex, with fine reticulation, collar separated by distinct, arched cross-groove; disc about 2x as broad as long, with scattered broad and shallow punctures, except at median line, smooth. Mesoprescutum (Fig. 2e) densely piliferous punctured, anteriorly with a few punctures, median line smooth and shiny except for setae near notauli. Scutellum (Fig. 2f) smooth, slightly convex, with distinct cross-line, frenum forming a transverse belt, 1/4 of scutellar length, and about 2x as wide as width of metanotum. Propodeum (Fig. 2f) with double alveolate row of median carina parallel sided, visible in whole length of propodeum; plicae indistinct, spiracular sulci shallow, sculpture beyond it formed by irregular rugulose puncturation; posterolateral corners small, triangular, rather sharp. Forewing (Fig. 2g) with stigmal vein slightly shorter than postmarginal vein.

Abdominal petiole (Fig. 2 f) almost 2x as long as broad, longitudinally carinate; bare. Metasoma (Fig. 2f) smooth and shiny.

Female: described by BOUČEK (1963).

Comments: Male of *S. slovakia* BOUČEK is similar to male of *S. nigroaenea* CURTIS, 1839 in having head as long as broad and long filiform antenna. But it differs from *S. nigroaenea* in having antenna with scape as long as the globular pedicel plus F1,F2 plus 1/2 F3; F1 is nearly 1.86x as long as the pedicel and about 2.2x as long as broad; the following segments almost equal in size, F2-F7 almost 1.83x as long as wide; clava 3.17x as long as broad, and 1.73x as long as F7 (in *S. nigroaenea* antenna with scape as long as the globular pedicel plus F1, plus F2; F1 nearly 2.5x as long as the pedicel and 3.5x as long as broad; F2-F7 almost 2x as long as wide; clava 2.7x as long as broad, and 1.9x as long as F7. Abdominal petiole almost 2.3x as long as broad).

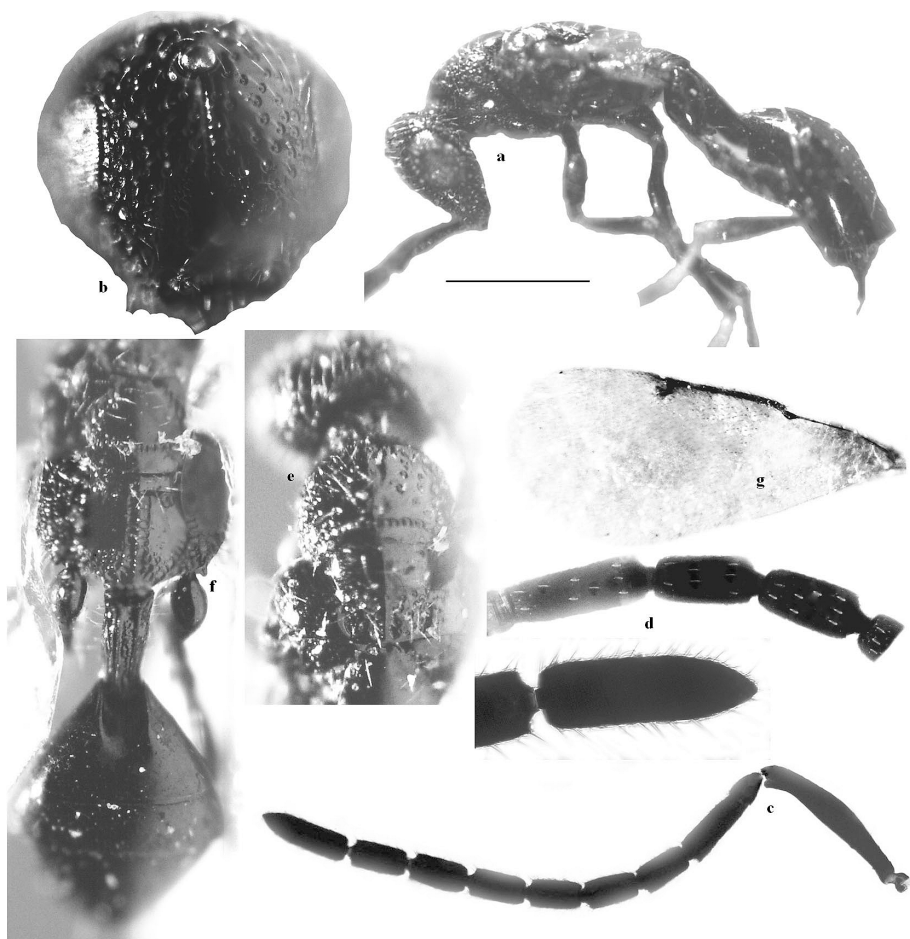


Fig. 2. *Spalangia slovaka* BOUČEK. Male. a. body; b. head in frontal view; c. antenna; d. basal segments of flagellum and clava with linear sensillae; e. pronotum and mesoscutum; f. Scutellum, propodeum, petiole and metasoma; g. forewing. (Scale bar for a= 0.7 mm; for b= 0.32 mm; for c= 0.38 mm; for d= 0.23 mm; for e= 0.28 mm; for f= 0.52 mm).

Spalangia rugulosa FÖRSTER, 1850

Spalangia rugulosa FÖRSTER, 1850: 507-509; holotype ♂, Förster collection, Vienna, Austria.

Material studied: Turkey, 1 ♀, Tokat, 30.iv.1984, swept from pasture, H. Çam; 5 ♀ ♀, Fidanlık, Tokat, 24-28.iv. 1989; H. Çam; 3 ♂ ♂, 06.vi.1989, H. Çam; 1 ♀, Sivas, 24.v.1989, swept from pasture, L. Karamihlioğlu. **New record for Turkey.**

Description, host and distribution were given by BOUČEK (1965)

D i a g n o s t i c c h a r a c t e r s : Pronotum and head very densely punctate, or rugoso punctate, interspaces much narrower than punctures themselves; Antennal scape dull, granulate, crowded irregularly; puncturations on head and pronotum usually without any interspaces.

***Spalangia irregularis* BOUČEK, 1963**

Spalangia irregularis BOUČEK, 1963: 442-443; holotype ♂, National Museum, Prague, Czech Republic. Paratypes 1 ♀, 2 ♂♂, BMNH.

M a t e r i a l s t u d i e d : Turkey, 1 ♂, Tokat, Fidanlık, 21.vi.1989, swept from pasture, H. Çam. **New record for Turkey.**

Description was given by BOUČEK (1963).

D i s t r i b u t i o n : Israel, Cyprus.

D i a g n o s t i c c h a r a c t e r s : Pronotum and head very densely punctate, or rugoso punctate, interspaces much narrower than punctures themselves; Antennal scape more or less shiny, at list on inner side; puncturations on head not crowded with distinct smooth interspaces; pronotum crowdedly, very irregularly rugoso-punctate; interspaces indistinct, scape finely granulated on outer side, subglabrous on the inner.

***Spalangia marashensis* nov.sp. (Figs 3a-m)**

M a t e r i a l s t u d i e d : Holotype ♂, Turkey, Kahramanmaraş, Pazarcık, 27.30.34 N, 37 23 42 E, 927 m, 15.vi.2005, swept from pasture, M. Doğanlar, Paratype: 1 female, Tokat, 08.vii.1993, swept from pasture, M. Doğanlar. All of the types were deposited in Insect Museum of Biological Control Station, Yüreğir, Adana, Turkey (IMBC).

E t y m o l o g y : The name is derived from the name of Kahramanmaraş form which the holotype collected.

D i a g n o s i s : Male antenna with F1 almost quadrate, and equal to other funicular segments; Pronotum and head very sparsely punctate, or sometimes with partial longitudinal rugosity in a cross-band; Pronotum without an isolated crenulate cross-line. Female antenna with flagellum distinctly widening towards tip; flagellum (antenna less scape) 0.63x as long as stretched head plus mesosoma (50:80); scape as long as pedicel plus F1-F6 combined; pedicel 2x as long as width; F1 is nearly 0.4x as long as the pedicel, as long as broad; the following segments almost equal in size, F2-F7 distinctly transverse, F2 1.67x, F7 1.63x as wide as long; clava 1.76x as long as broad, and 3.75x as long as F7. Linear sensillae on F1-F7 sparse, in one row, on clava very sparse, with 4 rows. Metasoma 1.2x as long as head plus mesosoma.

Male: Body length 1.35 mm. Body and legs black, tarsi yellow. Body (Fig. 3a) about 5x as long as depth of mesosoma; head (Fig. 3b) sparsely punctate, with interspaces about 5x as broad as punctures, sparsely hairy, in anterior view about 0.95x as high as wide; in dorsal view about 1.84x as wide as long; in lateral view about 1.66x as long as thick, with malar space about 0.67x as long as eye height and about 2x as eye width; median sulcus distinct, extending about to mid way of orbit, scrobal area with fine reticulations. Antenna (Fig. 3c) slender, filiform, flagellum (antenna less scape) 0.94x as long as stretched head plus thorax (84:90), sparsely hairy, hairs about 1/4 width of segment in

question; scape as long as the globular pedicel plus F1,F2+1/2 F3 combined; F1 is nearly as long as the pedicel (11:12), and about 1.1x as long as broad; the following segments almost equal in size, F2-F7 almost quadrate; clava 2.5x as long as broad, and as long as F7. Linear sensillae on F1 3 rows, on F2-F7 sparse, in 2 rows, on clava 3-4 rows.

Pronotum (Fig. 3d) without crenulate cross-line; collar in lateral view arched behind neck, immargined, slightly convex, with fine reticulation, collar separated by distinct, arched cross-groove; disc about 1.6x as broad as long, smooth except at median line, with fine reticulation. Mesoprescutum (Fig. 3d,e) finely reticulated, anteriorly with a few punctures, median line smooth and shiny except for sparse setae near notauli. Scutellum (Fig. 3 e) smooth, slightly convex, with fine cross-line, frenum forming a transverse belt, 1/3 of scutellar length, and about 2x as wide as width of metanotum. Propodeum (Fig. 3e) with a median carina parallel sided, visible in whole length of propodeum; plicae indistinct, spiracular sulci shallow, smooth; posterolateral corners small, triangular, rather sharp.

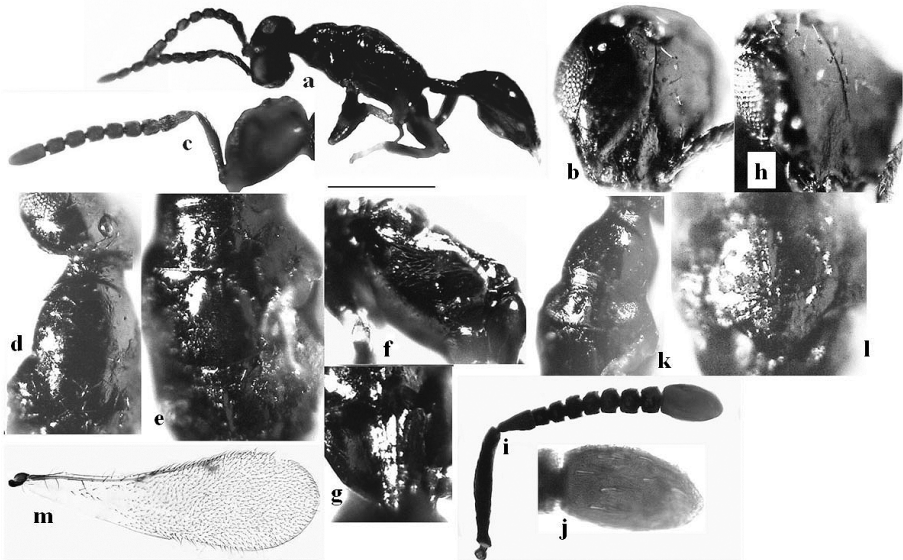


Fig. 3. *Spalangia marashensis* nov.sp. a-g. male. (a) body; (b) head, in frontal view; (c) head with antenna, in lateral view; (d) pro- and mesonotum; (e) mesonotum and scutellum, in dorsal view; (f) mesopleuron; (g) petiole; h-m. female: (h) head, in frontolateral view; (i) female antenna; (j) clava with sensillae; (k) pronotum and mesonotum, in dorso-lateral view; (l) propodeum, in dorsal view; (m) fore wing. (Scale bar for a= 0.46 mm; for b= 0.32 mm; for c= 0.48 mm; for d, e, k= 0.21 mm; for f= 0.22 mm; for g= 0.16 mm; for h= 0.26 mm; for i= 0.23 mm; for j= 0.10 mm; for k= 0.26 mm; for m= 0.40 mm).

Abdominal petiole (Fig. 3g) almost 2.5x as long as broad, longitudinally carinate; bare. Metasoma smooth and shiny, 0.6 x as long as head plus mesosoma.

Female: similar to male, except as follows: Antenna (Fig. 3i) with flagellum distinctly widening towards tip; flagellum (antenna less scape) 0.63x as long as stretched head plus mesosoma (50:80); scape as long as pedicel plus F1-F6 combined; pedicel 2x as long as width; F1 is nearly 0.4x as long as the pedicel, as long as broad; the following segments almost equal in size, F2-F7 distinctly transverse, F2 1.67x, F7 1.63x as wide as long; clava 1.76x as long as broad, and 3.75x as long as F7. Linear sensillae (Fig. 3 j) on F1-F7 sparse, in one row, on clava very sparse, with 4 rows. Metasoma 1.2x as long as head plus mesosoma. Forewing (Fig. 3m) with speculum open, with some setae between basal cell.

C o m m e n t s : *Spalangia marashensis* nov.sp. is similar to *Spalangia impunctata* HOWARD in having male antenna with F1 short; scutellum with incomplete cross-line and the sculpture of propodeum very weak. But it differs from *S. impunctata* in having F1 almost as long as pedicel, the latter 1.7x as long as width; funicular segments with two rows of linear sensillae; F2-F7 quadrate; propodeum with a median carina parallel sided, without visible in whole length of propodeum (in *S. impunctata* F1 distinctly shorter than pedicel, the latter 2x as long as width; funicular segments with one row of linear sensillae; F2-F7 distinctly transverse (Fig. 247 of GIBSON 2009); propodeum with double alveolate row, divided anteriorly (Fig. 245 of GIBSON 2009). In female antenna with flagellum distinctly widening towards tip; scape as long as pedicel plus F1-F6 combined; F1 is nearly 0.4x as long as the pedicel; the following segments almost equal in size, F2-F7 distinctly transverse, F2 1.75x, F7 1.67x as wide as long; clava 1.76x as long as broad, and 3.75x as long as F7. Linear sensillae on F1-F7 sparse, in one row, on clava very sparse, with 4 rows (in *S. impunctata* antenna (fig. 247 of GIBSON 2009) with flagellum almost filiform; scape as long as pedicel plus F1-F4 combined; F1 is nearly 0.5x as long as the pedicel; the following segments almost equal in size, F2-F7 distinctly transverse, F2 1.75x, F7 1.67x as wide as long; clava twice as long as broad, and 2.67x as long as F7).

***Spalangia erythromera* FÖRSTER, 1850**

Spalangia erythromera FÖRSTER, 1850: 512–513; lectotype ♀ (NHMW, not examined) by Bouček (1963: 466). Type data: [Germany] Aachen [lectotype: ♀ Or. Ex., Collect. G. Mayr].

M a t e r i a l s t u d i e d : Turkey: 1♂, Hatay, Dörtyol, Baytarlı, 14.iv.2008, swept from pasture, M. Doğanlar. **New record for Turkey.**

Synonyms, description, distribution and hosts were given by BOUČEK (1963) and GIBSON (2009).

D i a g n o s t i c c h a r a c t e r s : pronotum without an isolated crenulate cross-line; pronotum and head very sparsely punctate; male antenna with F1 distinctly longer than pedicel; scutellum with a developed frenal line; head sometimes with distinct punctures on upper face but not on gena (Fig. 152 of GIBSON 2009), and at most finely coriaceous within scrobes; tarsi often distinctly yellowish.

***Spalangia subpunctata* FÖRSTER, 1850**

Spalangia subpunctata FÖRSTER, 1850: 516-518; lectotype ♀ (NHMW, not examined) designated by BOUČEK (1963: 473). Type data: [Germany], near Aachen [lectotype: ♀ Or. Ex., Germania, Collect. G. Mayr].

Spalangia leptogramma FÖRSTER, 1850: 511-512; lectotype ♀ (NHMW, not examined) designated by Bouček (1963:473). Type data: [Germany], Cologne, bank of Rhine [lectotype: ♀. Or. Ex. Coeln, Collect. G. Mayr]. Synonymy by Bouček (1963: 473).

Description, distribution and hosts were given by BOUČEK (1963) and GIBSON (2009). It was recorded from Turkey by DOĞANLAR (1985) and ÖNCÜER (1991).

M a t e r i a l s t u d i e d : Turkey, 1♂, Erzurum, 04.vi.1982, swept from pasture, M. Doğanlar; 1♂, Oltu, Erzurum, 05.vii.1984, swept from *Pyrus malus*, M. Doğanlar; 1♂, Adana, Karataş, 19.v.2006, swept from pasture, M. Doğanlar; 1♀, Ardahan, 07.viii.1981, swept from pasture, M. Doğanlar; Tokat, 1♀, 1♂, 01.vi.1986, 2♀♀, 2♂♂, 23.iv.-19.vi.1989, swept from pasture, H. Çam; 1♀, 1♂, 29.vi-08.vii.1993, swept from pasture, M. Doğanlar; 2♀♀, 1♂, Fidanlık, Tokat, 12.v.-06.vi.1989, swept from pasture, H. Çam; 2♂♂, Taşlıçiftlik, Tokat, 02.v.-27.vi. 1989, swept from pasture, H. Çam; 1♀, Gümenek, Tokat, swept from pasture, H. Çam.

D i a g n o s t i c c h a r a c t e r s : pronotum without an isolated crenulate cross-line; pronotum and head very sparsely punctate; male antenna with F1 distinctly longer than pedicel; Scutellum with the frenal line weak or lacking; head without distinct punctures on upper face, and smooth within scrobes; tarsi mostly black or brown; Fore wing with up to 7 setae on mediocubital fold and with setae in basal cell extending proximally at most to level of most distal seta on mediocubital fold (Fig. 193 of GIBSON 2009); funicle usually with at least fu2 and sometimes all except apical segments quadrate to oblong (Fig. 444 of GIBSON 2009); petiole with at most 1 seta.

***Spalangia fuscipes* NEES, 1834**

Spalangia fuscipes NEES, 1834: 270; ♀, ♂ syntypes lost (BOUČEK 1963: 476). Type data: [Germany].

M a t e r i a l s t u d i e d : Turkey: 1♀, Gaziantep, Islahiye, 23.iv.2008, swept from pasture, M. Doğanlar; Erzurum, 1♂, 3.v.1982; 1♂, 04.vi.1982, swept from pasture, M. Doğanlar; Tokat, 1♂, 27.iv.1989, H. Çam; 1♂, 26.v. 1989, H. Çam; 1♂, 19.vi.1983, H.Çam; Ağrı, Tahirdağ cross, 1♂, 13.vii. 2012, M. Doğanlar.

Description, distribution and hosts were given by BOUČEK (1963) and GIBSON (2009). It was recorded from Turkey by some works (BOUČEK 1963; ÖNCÜER 1991; ANDRIESCU & MITROIU 2001; THUROCY & O'CONNOR 2009).

D i a g n o s t i c c h a r a c t e r s : pronotum without an isolated crenulate cross-line; pronotum and head very sparsely punctate; male antenna with F1 distinctly longer than pedicel; Scutellum with the frenal line weak or lacking; head without distinct punctures on upper face, and smooth within scrobes; tarsi mostly black or brown; fore wing with at least 7 setae on mediocubital fold and with setae in basal cell extending proximally obviously beyond level of most distal seta of mediocubital fold (Fig. 191 of GIBSON 2009); funicle with fu2 and all subsequent segments obviously transverse (Figs 187, 189 of GIBSON 2009); petiole with 2 or more setae, though setae sometimes difficult to see (Fig. 186 of GIBSON 2009).

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Buchbesprechung

KLAUSNITZER B., KLAUSNITZER U., WACHMANN E. & Z. HROMÁDKO: **Die Bockkäfer Mitteleuropas**. – Die Neue Brehm-Bücherei Bd. 499, VerlagsKG Wolf, Magdeburg, 2016. 2 Bände, 692 S.

Mit dem zweibändigen Werk liegt nun die 3., stark überarbeitete und erweiterte Auflage vor. Es fasst das Wissen zur Erforschung der Bockkäfer der letzten 30 Jahre zusammen und gibt damit einen Überblick über die in Mitteleuropa vorkommenden Arten, beschreibt ihre Lebensweise und Umweltansprüche und sollte die problemlose Bestimmung aller Arten erlauben.

Band 1 dient der Biologie und der Bestimmung der mitteleuropäischen Bockkäfer. Die Nomenklatur richtet sich nach dem 6. Band des "Catalogue of Palaearctic Coleoptera" (LÖBL & SMETANA 2010, eds). Dieser erste Band beinhaltet Systematik, Morphologie, Verbreitung und Artendichte, Lebensweise und Entwicklungsstadien, Voltinismus, Überwinterung, Umweltwiderstände und natürliche Feinde, die Beziehungen zum Menschen und die Bestimmungstabellen für die Imagines. Für die Larven wird eine Einführung vorgelegt, die die Zuordnung zu den Unterfamilien sowie ausgewählten Gattungen gestattet. Auf eine komplette Bestimmungstabelle bis zu den Arten musste verzichtet werden. Dieser erste Band ist reichhaltig illustriert (Farbfotos, farbige Grafiken, immens viele Detailzeichnungen zur Biologie und als Bestimmungshilfen) und mit zahlreichen informativen Tabellen versehen.

Im zweiten Teilband werden alle in Mitteleuropa vorkommenden Bockkäferarten abgehandelt und mit Farbfotos abgebildet.

Eine fantastische, kompakte Darstellung unserer einheimischen Bockkäfer mit allen wesentlichen Aspekten zu Biologie, Bestimmung und Naturschutz – überaus empfehlenswert.

CASTELLÓ J.R.: **Bovids of the World**. – Princeton University Press, Princeton and Oxford, 2016. 664 S.

Die Familie Bovidae ist die größte und diverseste Gruppe der Huftiere, also Wiederkäuer mit hohlen Hörnern – zu deutsch "Rinderartige", im Englischen eigentlich ohne Populärnamen. Die 279 Arten zeigen eine immense Vielfalt an Aussehen, Habitatansprüchen und Verhalten, vom nur 1,5kg schweren Kleinstböckchen bis hin zum fast 1200kg wiegenden Wasserbüffel, illustriert durch 337 Farbtafeln mit mehr als 1500 Fotos (von Habitus und Details).

Der aktuelle, nomenklatorische Stand entspricht dem "Handbook of the Mammals of the World" (Lynx Edicions, 2011) und der "Ungulate Taxonomy" von Groves & Grubb (2011), welche dem phylogenetischen Artkonzept folgen. Die Besonderheit dieses Buches besteht in den Fotos – das "Handbook of the Mammals" benutzt Zeichnungen. Dies war sicher mit die größte Herausforderung, auch die seltenen Arten fotografisch zu dokumentieren. Um Besonderheiten und Unterschiede dieser Arten darzustellen, wurden alle Fotos frei gestellt. In Ergänzung zum "Handbook of the Mammals" finden sich hier vielfach Fotos von beiden Geschlechtern, Jungtieren, Kopfportraits, Farb- und Zeichnungsvarianten und diverse Ausprägungen der Hörner. Einziger Schwachpunkt aus meiner Sicht sind die (recht unspektakulären) Verbreitungskarten ohne Ländergrenzen;

in vielen Fällen wird nicht deutlich, ob eine Art evt. noch im Nachbarland vorkommt oder nicht.

Einer kompakten, 16-seitigen Einführung folgen die Artbeschreibungen, jeweils eine Doppelseite mit Fotos, Merkmalen, Verbreitungskarte und Ausführungen zu Reproduktion, Verhalten, Verbreitung, Habitat und Schutzstatus. Zum Schluss folgen 9 Tafelseiten mit Schädeln und Hörnern, einer Seite empfehlenswerter Literatur und der Index.

Ein kompaktes Nachschlagewerk oder ein gewichtiger Feldführer – in jedem Fall eine überaus wichtige und empfehlenswerte Lektüre.

R. Gerstmeier

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