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Review of the genus *Ammatomus* A. COSTA, 1859 (Hymenoptera, Crabronidae) from the Palearctic region with description of four new species

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A b s t r a c t : The genus *Ammatomus* is reviewed in the Palearctic region. A key to species is given. The following species are described: *Ammatomus aljahdhamii* nov.sp. from Oman (female only), *Ammatomus grandcourti* nov.sp. from United Arab Emirates, Yemen, Israel, Sudan, Oman; *Ammatomus vanharteni* nov.sp. from United Arab Emirates, Oman, Yemen, Iran; *Ammatomus wathabensis* nov.sp. from United Arab Emirates, and *Ammatomus* yemenensis nov.sp. from Yemen. The following species are restored from synonymy to rank of valid species: *Ammatomus nikolajevskii* (GUSSAKOVSKIJ, 1928) (was a synonym of *A. mesostenus*) *and Ammatomus saharae* (HANDLIRSCH, 1895) (was a synonym of *A. rufonodis*). *Ammatomus asiaticus* (RADOSZKOWSKI 1886) is recorded from North Africa and Israel for the first time.

K e y w o r d s : Hymenoptera, Crabronidae, *Ammatomus*, West Palearctic region, new species, key to species.

Introduction

The genus *Ammatomus* includes 30 described species with an Old World distribution (PULAWSKI 2018). The genus was revised by PULAWSKI (1973) for the Palearctic region, and by ARNOLD (1929) for the subsaharan region in Africa. In the treatment of the genus *Ammatomus* from the United Arab Emirates (SCHMID-EGGER 2011, 2014), I already suspected that the species mentioned as *A. mesostenus* might belong to a different species. In the meantime I was able to examine more material from this and from related species from Africa and western Asia. The examination yielded the result that *A. mesostenus* s.lat. consists of four species, and three of them occur in the Arabian peninsule, two of them in the United Arab Emirates (UAE). I found also, that in *A. rufonodis* the described "infraspecific variation" (PULAWSKI 1973) represents true characters for species recognition, and three species are recognized in this lineage. Among them one species is also undescribed. For that reason, a review of the whole genus and an updated key to species for the Palearctic region is given here. The present treatment recognizes 12 species belonging to the Palearctic fauna. Yemen is here seen as a part of the Palearctic region for practical reasons, however most species from Yemen and southern Oman already belong the Afrotropical fauna.

The review raised the question of the taxonomic value of different characters in different geographic area (= "geografic variation"). In the present treatment, specimens with constant character differences between regions are seen as valid species and not as

"geografic forms" as PULAWSKI (1973) did. This assumption will be supported by the fact, that intraspecific variation in all examined species is low, especially in the form of Tergite I (T1), which is an important recognition character. Some of the closely related species also overlap in distribution, which confirms their state as valid species. In general, the genus *Ammatomus* has only few characters of diagostic value, which makes identification difficult.

Materials and methods

The following character abbreviations are used.

- AS = Antennal segments.
- T1 = tergite I, T2 = tergite II, etc.: length of T1 is measured from above, with apical part of T1 horizontal (T1 is basally often curved down), as seen in the photographs. Tergal width is measured on the largest diameter, mostly in the apical third. The ratio is given in as ratio of lenght/width ("T1 1.5x" means: T1 1.5x as long as maximum width).
- S1 = sternite 1, s2 = Sternite II, etc.

Length of metanotum etc. are measured in direction of body axis (e.g. "length" of metanotum is distance between postnotum and scutellum).

Characters given in the key in brackets "[...]" are descriptive and not distinctive. They may also refer to other species. However, they are mentioned in the key to faciliate species recognition. Photographs were made by a Nikon SMZ18 stereo microscope and a Nikon DS-Fi3 camera, apart from photos of *Ammatomus nikolajevskii*, which were taken by Mikhail Mokrousov.

Some of the more common species are not discussed in detail here; see PULAWSKI (1973) for description and further records.

Acronyms of depositories and other institutions

CSE .....private coll. C. Schmid-Egger, Berlin, Germany
Leiden .....Rijksmuseum Leiden, the Netherlands
Mokrousov .....Private coll. Mikhail Mokrousov, Novgorod, Russia
NHMW .....Naturhistorisches Museum Wien (Vienna), Austria
OLL.....Oberösterreichisches Landesmuseum, Linz, Austria
Schlaefle.....private coll. Wolfgang Schlaefle, now in Naturhistorisches Museum Bern, (Switzerland)
ZMMU .....Zoological museum of Moscow University, Russia
ZSM .....Zoologische Staatsammlung München (Munic), Germany

Key to species of *Ammatomus* from the Palearctic region including Yemen

Key to females

1 T1 large, not petiolate, abdomen without constriction between T1 and T2 (figs 3, 19). [TI at most as long as maximum width] (*A. aljahdhamii* is somewhat intermediate, see description).....2

- T1 strongly petiolate, with distinct constriction between T1 and T2 (fig. 4) 3
2 Mesonotum, metanotum and sternites black. Tergal bands narrow, as large as length of metanotum (fig. 1). 10 mm. Oman ..... *A. aljahdhamii* SCHMID-EGGER nov.sp.
- Mesonotum, metanotum and at least S2 with yellow bands or spot. Tergal bands at least 2x as large as length of metanotum (fig. 19). [Mesosoma and abdomen with coarse punctation. Band of T1 and T2 medially largely interrupted. Propodeum without pubescence.]. 9-11 mm. Southeastern Europe to Central Asia ..... *Ammatomus rogenhoferi* HANDLIRSCH
3 Hindtarsomeres I-III apically black (fig. 22). S2 with large yellow band (cf. fig. 24), except in *A. coarctatus* 4
- Hindtarsomeres I-III all yellow (fig. 6). S2 with lateral triangular spots 7
4 T1 with lateral yellow spots. T1 shorter than maximum width (fig. 8). S2 with lateral triangular spots. [Punctation of mesoscutum and other parts of mesosoma dense, most interspaces smaller than punctures. T1 black apart from yellow spots.]. Southern Europe to Central Asia ..... *Ammatomus coarctatus* SPINOLA
- T1 with continuous yellow band (fig. 7). T1 at least 1.3x 5
5 T1 1,3x - 1.4x. [T1 red, with yellow apical band]. Algeria ..... *Ammatomus saharae* (HANDLIRSCH, 1895)
- T1 at least 1,5x 6
6 Yellow band on T1 medially not emarginated. Transparent apical margin of T1, T3 and T4 maximal half as wide as yellow band (fig. 21). Scutellum with large yellow band, mesoscutum laterally with large yellow band in whole length (fig. 20). [Pubescence of propodeal declivity longer and sparse, compared to *A. grandcourti*. T1 apart from yellow band always red,]. Turkey to Central Asia; Oman ..... *Ammatomus rufonodis* RADOSZKOWSKI
- Yellow band on T1 medially emarginated. Transparent apical margin of T1, T3 and T4 as wide as yellow band medially (fig. 10). Scutellum black, yellow band of mesoscutum laterally in most specimens restricted to apical third (fig. 9). [T1 apart from yellow band, red or black]. Israel. Arabia, Sudan ..... *Ammatomus grandcourti* SCHMID-EGGER nov.sp.
7 Hind claw and hindtarsomere V yellow, at most with some brownish parts (fig. 6). Lateral carina of T1 reaches apical depression of T1 (fig. 5). Central Asia to North Africa ..... *Ammatomus asiaticus* RADOSZKOWSKI
- Hind claws dark brown or black. At least apical half of hindtarsomere V evenly black, only apically brown in *A. wathabensis*. Lateral carina of T1 ending in basal half of tergite or shorter 8
8 T1 apically without clear transparent lamella, the apical margin has the same colour as disc or is darker, or somewhat paler red than disc. T1 apically with two narrow lateral spots or a narrow band; spots pale yellow, in a distance of about 1.5x diameter of hindocellar diameter apart from hind margin (fig. 36). T2 in most specimens red (apart from apical yellow band). Claws and apical half of hindtarsomere V brownish. Punctation of mesoscutum finer and interspaces larger, compared with punctation of mesopleuron (fig. 38). [Lower mesopleuron with fine and dense silver pubescence. T1 1,2x] ..... *Ammatomus wathabensis* SCHMID-EGGER nov.sp.
- T1 apically with distinct transparent margin, and with yellow band or large lateral spots between margin and disc of tergite; remaining part of tergite red or black (fig 32). T2 black. apart from apical yellow band. Claws and apical half of hindtarsomere V black. Punctation of mesoscutum similar to that of mesopleuron (fig. 31) 9
9 T1 1.3x - 1.4x (fig. 32) 10
- T1 shorter, at most 1.2x (fig. 16). [Disc of T1 black] 11
10 Mesoscutum with dense punctation, most punctures less than a diameter apart (fig. 31) (however, puncture is irregular, and there are also larger interspaces). Body colour whitish yellow (fig. 29). Disc of T1 red. Arabia, Iran, Israel? ..... *Ammatomus vanharteni* SCHMID-EGGER nov.sp.

- Mesoscutum with sparse punctation, most punctures more than a diameter apart (fig. 50). Body colour lemon yellow (fig. 47). Disc of T1 black. Russia, Central Asia .... *Ammatomus nikolajevskii* (GUSSAKOVSKIJ, 1928)

11 Body colour lemon yellow. T1 with continuous yellow band (fig. 14). T1 1x (fig. 16). North Africa ..... *Ammatomus mesostenus* HANDLIRSCH

- Body colour whitish yellow. T1 with large lateral spots, space between spots as large as basal diameter of hindtibia (fig. 41). T1 1.2x (fig. 42). Yemen..... ..... *Ammatomus yemenensis* SCHMID-EGGER nov.sp.

Key to males

The male of *A. aljahdhamii* is undescribed.

1 T1 large, not petiolate, abdomen without constriction between T1 and T2 (cf. fig. 19). [T1 at most 1x. Mesosoma and abdomen with coarse punctation. Yellow bands on T1 and T2 medially interrupted. Propodeum without pubescence]. 8-10 mm. Southeastern Europe to Central Asia (if from Oman, cf. *A. aljahdhamii*) .... *Ammatomus rogenhoferi* HANDLIRSCH

- T1 strongly petiolate, with distinct constriction between T1 and T2. (fig. 12).....2

2 Hindtarsomeres I-III apically black (fig. 22). S2 with large yellow band, except *A. coarctatus* (fig. 24).....3

- Hindtarsomeres I-III all yellow. S2with lateral triangular spots.....7

3 T1 with lateral yellow spots. T1 short, 1.3x (cf. fig. 8). S2 with lateral triangular yellow spots. [Punctation of mesoscutum and other parts of mesosoma dense, most interspaces smaller than punctures. T1 black apart from yellow spots]. Southern Europe to Central Asia ..... *Ammatomus coarctatus* SPINOLA

- T1 and S2 with continuous yellow band. T1 at least 1.4x 4

4 T1 1.4x (fig. 4). [T1 red with apical yellow band, medially emarginated, apical transparent margin of T1 as large as yellow band medially]. Algeria .... *Ammatomus saharae* (HANDLIRSCH, 1895)

- T1 at least 1.6x (fig. 23) [if shorter, not from Algeria].....6

5 T1 1.6x. lemmon yellow. Band on T1 medially not emarginated. Transparent apical margin of T1, T3 and T4 maximal half as wide as yellow band (in males from Oman is T1 longer, and yellow band of T1 narrower, see description) (fig. 23, 26). Scutellum with large yellow band, mesoscutum laterally with large yellow band in whole length. [Pubescence of propodeal declivity longer and sparse, compared to *A. grandcourti*. T1 apart from yellow band always red,]. Turkey to Central Asia, Oman .... *Ammatomus rufonodis* RADOSZKOWSKI

- T1 1.7-1.8x. Tergal bands whitish-yellow. Band on T1 medially emarginated (fig. 12). Transparent apical margin of T1, T3 and T4 as wide as yellow band medially (fig. 13). Scutellum black, yellow band of mesoscutum laterally in most specimens restricted to apical third. [Pubescene of propodeal declivity shorter and very dense, compared to *A. rufonodis*. T1 apart from yellow band. red or black]. Israel, Arabia, Sudan..... ..... *Ammatomus grandcourti* SCHMID-EGGER nov.sp.

6 Hind claw and hindtarsomere V yellow, at most with some brownish parts (fig. 6). Lateral carina of T1 reaches apical depression of T1 (fig. 5). Central Asia to North Africa ..... *Ammatomus asiaticus* RADOSZKOWSKI

- Hind claws dark brown or black. At least apical half of hindtarsomere V evenly black, only apically brown in *A. wathabensis*. Lateral carina of T1 ending in basal half of T1 or is shorter.....7

7 T1 apically without clear transparent lamella, the apical margin has the same colour as disc or is darker, or somewhat paler red than disc, apically with two narrow lateral spots or a narrow band; spots pale yellow, in a distance of about 1.5x diameter of hindocellar diameter from hind margin (fig. 40). T2 in most specimens red (fig 39), (apart from apical yellow band). Claws and apical half of hindtarsomere V brownish.. [Lower mesopleuron with fine and dense silver pubescence. T1 1.4x] .... *Ammatomus wathabensis* SCHMID-EGGER nov.sp.

- T1 apically with distinct transparent margin, and with yellow band or large lateral spots between margin and disc of tergite; remaining part of tergite red or black (fig. 34, 52). T2 black. apart from apical yellow band. Claws and apical half of hindtarsomere V black 8

8 T1 1,5x - 1.6.x (fig. 52, 53). [Body colour lemon yellow. Punctation of mesonotum in direct comparisation finer and more sparse as in remaining species]. Russia, Central Asia ..... *Ammatomus nikolajevskii* (GUSSAKOVSKIJ, 1928)

- T1 at least 1.7x (fig. 18) 9

9 T1 red apart from yellow apical band (fig. 34). [Scutellum in most specimens partly or all yellow. Body colour whithis yellow]. Arabia, Iran, Israel? ..... *Ammatomus vanharteni* SCHMID-EGGER new species

- T1 black apart from yellow apical band 10

10 Body colour lemon yellow. T1 1.8x, slender (fig. 18). Scutellum may be touched by yellow. North Africa. ..... *Ammatomus mesostenus* HANDLIRSCH

- Body colour pale yellow. T1 1.7x, apically somewhat bulged (fig. 46). Scutellum black. Yemen ..... *Ammatomus yemenensis* SCHMID-EGGER nov.sp.

Taxonomy

Ammatomus aljahdhamii SCHMID-EGGER nov.sp. (figs 1-3)

Holotype: female Oman, 30.xi.2018 Dhofar, Salalah, Ayn Athum 17.114N 54.364E, leg. Al-Jahdhami (coll ZSM).

Recognition: *A. aljahdhamii* is unique amoung Palearctic *Ammatomus* species by the extended black body colour with only a few whitish marks, by a relatively large T1 (the species is intermediate between *A. rogenhoferi* and remaining species) and with the lack of punctation on propodeum and abdomen.

Description of holotype, female: Body length 10.2 mm. Colour: black, whitish yellow are: clypeus apart from lower third, large spot on inner eye margin below scape, very small spot below scape, scape (AS I) below, thin band on hindmargin of pronotum, pronotal lobe, lateral spots on T1 apically, narrow bands on T2 and T3, medially interrupted, medial band on tergites V, indistinct medial spot on T5. Forefemora with large spot on inner side, and small spot on outer side, midfemora with small spot on outer side. Mid- and hindtibiae black with brownish innerside, hindtibia black with brownish apex. Tarsi dark yellowish-green, hindtarsomere black in apical half. AS VIII-XII orange red below, last AS nearly completely red. Wing venation black. Morphology: Clypeus and frons with some erect white setae, remaining body without erect setae, with fine and sparse pubescence. T1 1x. Apical margin of T4 and T5 with some white bristles. Frons around midocellus with some irregular punctation, mesoscutum and scutellum with sparse punctation, mesopleuron with dense punctation, punctures 0,3 - 1 diameters apart, punctures larger than those of mesoscutum.

Male: unknown.

Distribution: Southern Oman, Dhofar region.

Etymology: The species is dedicated to the Omani entomologist Ali Al-Jahdhami, who collected the holotype.

Ammatomus asiaticus (RADOSZKOWSKI, 1886) (figs 4-7)

Lestiphorus asiaticus RADOSZKOWSKI, 1886: 36, male. Holotype or syntypes: male, Turkmenistan: no specific locality (Kraków).

Specimens examined: Morocco, male 12.vi.2014 Ouarzazate, 30.936N, 6.988W. Tunisia female 18.v.2008 Gafsa; female 23.v.1999 E Kebil. Egypt 15.vi.2013 Sinai, St. Katherines. Israel, male 17.vi.1965 Mesada (all coll. CSE).

Recognition: *A. asiaticus* is characterized by a unique character combination. The lateral keel of T1 reaches the apical margin or ends nearby, whereas the keel ends near the middle of the T1 in remaining species. Hindtarsomere V and claws are pale yellow, or at least are touched by some bright brown, whereas they are black or at least dark brown in most related species.

Variation: Colour of examined specimens is varible. T1 is red, except in the male from Israel, with a black T1 (apart from yellow apical tergal band). Scutellum black in all specimens, except in the female from Tunisia.

Distribution: Kazakhstan, Turkmenistan, Uzbekistan: (PULAWSKI 1973, 2018), Israel, North Africa.

Ammatomus coarctatus (SPINOLA, 1808) (fig. 8)

Gorytes coarctatus SPINOLA, 1808: 245, sex not indicated. Syntypes: males, Italy: Liguria: near Novas (Mus. Zool. Univ. Torino).

Gorytes handlirschi F. MORAWITZ, 1890: 610, male, female (as *Handlirschi*, incorrect original capitalization). Lectotype: female, Turkmenistan: Askhabad (ZIN), designated by PULAWSKI (1973).

Gorytes mavromoustakisi BALTHASAR, 1954: 149, male Holotype: male, Cyprus: Yermasoyia River (V. Balthasar coll., Prague).

Gorytes mitjaevi KAZENAS, 1972: 148:, male, female, Holotype: female, Kazakhstan: Lavar 90 km NE Alma Ata (ZIN).

Specimens examined from: Europe: Greece, France, Italy, Ukraine, Croatia, Czech Republic, Cyprus. Asia: Armenia, Kazakhstan, Kirghistan, Turkmenia, Turkey, Iran, Syria, Jordan.

Recognition: The species is unique by a dense and coarse punctation of mesosoma in combination with a medially largely interrupted band on T1.

Distribution: Southern Central and Southern Europe to Central Asia, southwards to Israel and Jordan, one doubtful record from Algeria before 1898 (see PULAWSKI 1973).

Ammatomus grandcourti SCHMID-EGGER nov.sp. (figs 9-13)

Ammatomus rufonodis in SCHMID-EGGER (2011: 490).

Holotype: female United Arab Emirates, 11-19.iii.2009 Waidi Maidaq 25.31N (leg. et coll. CSE, as *A. rufonodis* in Schmid-Egger 2011). Paratypes: Sudan female 4.xi.1961, Ed Damer, Hudeiba, leg. Reimann, det as *A. rufonodis* by W. Pulawski (CSE); female Yemen, 6.iii.2013, Sana, University Campus, leg. Halada (OLL); Israel male 10.vi.1995 Arava Valley, Iddan 30°48'N 35°16'E (leg. et coll CSE).

Remark: *A. grandcourti* keys out with *A. rufonodis* with the key of PULAWSKI (1973), but differs in some important characters from the latter. The female occurs in two colour forms, each with black and with a red colour on T1. This variation is unique among the here treated species.

Diagnosis: *A. grandcourti* (together with *A. rufonodis*) has a longer T1 as *A.*

saharicus. The species differ from the similar *A. rufonodis* mainly by a narrower yellow band on T1, with a larger apical transparent margin of T1, T3 and T4. The transparent margin is in average as wide as tergal bands, and distinctly wider in *A. rufonodis*. The male of *A. grandcourti* has also a somewhat longer T1 compared to *A. rufonodis* (1.8x versus 1.6x). See also key for remaining characters. Males of *A. rufonodis* from Oman have yellow band of T1 narrower than in specimens from Central Asia and Turkey. They differ from the male of *A. grandcourti* mainly by the lemon yellow colour, what is whitish-yellow in *A. grandcourti*, and by the remaining key characters.

Description of holotype, female: Body length 8.5 mm. Colour: Black, whitish yellow are: Clypeus, space below antennal socket, short band on lower eye margin, AS I-II, underside of apical half of AS III, pronotal lobe, narrow band on apcial pronotal margin, connecting pronotal lobes, spot each on mesoscutum laterally in apical corner, metanotum, basal spot on tegula, apical band on T1, medially with V-shaped interruption, bands on T2-T5, large band on S2, medially with large V-shaped interruption. Mandible basally black, followed by white spot, medially red and in apical third black. Labrum red. Antenna red, medial AS brown above. Trochanter, coxa, T1 apart apical yellow band, T2 laterally, S2 medially red. Fore and midleg: femora red with white band below in apical half, tibiae basally white, apically red, tarsomeres white with reddish apex. Hind femur red, hind tibia basally below red, basally above white, black apical half. Hindtarsomeres I-IV white, I-III with red apex, hindtarsomere V with white base, remaining part and claws black. Wing venation reddish, wings transparent, basal sclerite of forewing red with white mark. Morphology: Face including clypeus and vertex, mesopleuron and propodem with dense, silver pilosity. Propodeal dorsum without pilosity. T1 1.5x, mesoscutum with coarse puncture, punctures 0,2 - 2 diameters apart. Tergites with dense punctation, similar to that of mesoscutum. For details of T1, see figure.

Variation of females. Body length: 10 (Sudan) and 8 mm (Yemen). In both paratype females, red colour of T1 and S1 is replaced by black, apart from some red on T1 laterally. In female from Yemen, red colour of legs is also replaced by black. AS VI-XII are mainly red without dark in female from Sudan, and AS IV-X all black in female from Yemen.

Descripton of male: Body length 8.5 mm. In morphology, the males agree with the females, apart from longer T1 (1.8x). Colour whitish-yellow, without any red. Scutellum and AS III-XII black, mesonotal spot small. Large transparent impressed margins on T2-T4, as wide as tergal band. Transition between tergal disc and impressed margin crenulate.

Ethymology: The species is dedicated to Edwin Mark Grandcourt, a fisheries and marine scientist of the Marine Assessment & Conservation Section of the Environment Agency – Abu Dhabi, who passed away in 2018 at the young age of 49.

Disribution: UAE, Yemen, Israel, Sudan.

Ammatomus mesostenus (HANDLIRSCH, 1888) (figs 14-18)

Gorytes mesostenus HANDLIRSCH, 1888: 345, male. Holotype: male, Egypt: no specific locality (Lausanne, Marquet coll.).

Gorytes rhopalocerus HANDLIRSCH, 1895: 855, male, female. Lectotype: female, Algeria: Biskra, designated by Pulawski 1973: 280.

Specimens examined: Egypt male, female 25.ix.1992 Oasis Al Fayum, Birkat

Karun; Egypt, 2 males 11.8.1929 Gizeh (OLL); Tunisia male 18.vi.1994 Gafsa, Oasengärten; Tunisia, female 22.vi.1994 11 km s Jendouba, Mellègue-Flußufer, (all leg. et coll. CSE); Morocco male 16.v.1997 100 km S of Zagora, Mahmid (OLL).

R e m a r k : A detailed examination of several *A. mesostenus* specimens (identified with the key of PULAWSKI 1973) results in four different species. Three of them had not been recognized until today and will be described here. The most important recognition characters are colour pattern and form of T1. Already PULAWSKI (1973) mentioned the difference in length of T1 and different colour, but he treated all different taxa as "geografic variation". *A. rhopalocerus* HANDLIRSCH, 1895, described from Algeria, and *A. mesostenus* s.str., described from Egypt, are conspecific in my opinion. Examined material from Egypt and Tunisia agree, and there are no differences in the description of PULAWSKI (1973). The author mentions under "variation" different specimens from Israel, Iraq and Iran with red T1. These specimens agree with the here described *A. vanharteni*. Two specimens from Yemen/Aden mentioned in PULAWSKI (1973) also may belong to *A. vanharteni*.

D i a g n o s i s : *A. mesostenus* is characterized by distinctly lemon yellow coloured body marks, and by lack of red marks on tergites. T1 has a continuous yellow band, and it is comparatively short in female.

D i s t r i b u t i o n : North Africa. PULAWSKI (1973) mentions specimens from many countries between Morocco in the west and Kazakhstan in the east. Because of the newly described species from Arabia and Asia, only records from North Africa can be confirmed to be *A. mesostenus*. Specimens from southwest Asia (Israel, Iraq etc.) and from Central Asia have to be examined for their true identity and probably belong to other species.

Ammatomus nikolajevskii (GUSSAKOVSKIJ, 1928), stat. rest. (figs 47-53)

Gorytes nikolajevskii GUSSAKOVSKIJ, 1928: 17, male Lectotype: male, Uzbekistan: Sayat near Khiva (ZIN), designated by PULAWSKI 1973: 280.

S p e c i m e n s e x a m i n e d : Uzbekistan, female 7.vii 1997 near Karshi city, Khanabad vill., 38.847N, 65.936E, V. Gromenko leg. Uzbekistan, male 16.v 2015 8 km NW Mubarek, 39.341N 65.092E, K. Samartzev leg. Russia, male and female, 13.vii 2015 Kalmykia, 3 km SSE Tzagan-Nur, 47.340N 45.240E M. leg. (all coll Mokrousov).

R e m a r k : The species was synonymised with *A. mesostenus* by PULAWSKI (1973). Due to the kindness of Mikhail Mokrousov, I could examine specimens from near the type area in Uzbekistan and from Russia. They belong clearly to a species different from *A. mesostenus* s.str. (here I could compare with specimens of *A. mesostenus* from the type area Egypt). The Central Asian und Russian specimens have some similarities with *A. vanharteni*, new species, but differ clearly by colour pattern, mesonotal punctation and shape of T1 from species from Egypt. Therefore, *A. nikolajevskii* is restored from synonymy and treated as valid species here. The *A. mesostenus* lineage includes four species, *A. mesostenus* in North Africa, *A. nikolajevskii* in Russia and Central Asia, *A. vanharteni* in Arabia and Iran, and *A. yemenensis* in Yemen.

D i a g n o s i s : The female of *A. nikolajevskii* is characterized by a fine and sparse punctation on mesoscutum, which is distinctly denser and coarser in remaining species of the *A. mesostenus* lineage. It shares a long T1 with *A. vanharteni* (1,4x in female from Uzbekistan, 1,3x in female from Russia), which is 1.0x in *A. mesostenus* and 1.2x in *A. yemenensis*. It is clearly lemon yellow coloured, and not whitish yellow as in *A. vanharteni.*

The male has the shortest T1 within the *A. mesostenus*-lineage (1,55 in both examined specimens), and is also characterized by a distinctly lemon yellow body colour and lack of red marks on the body or leg.

V a r i a t i o n : In both examined specimens from Russia yellow colour is more reduced (scutellum black in male, band on T1 interrupted etc., see figs 49 and 52), compared with the specimens from Uzbekistan.

D i s t r i b u t i o n : Russia/Kalmykia, Uzbekistan. PULAWSKI (1973) also mentions Kazakhstan, Turkmenistan and Tajikistan.

Ammatomus rogenhoferi (HANDLIRSCH, 1888) (fig. 19)

Gorytes rogenhoferi HANDLIRSCH, 1888: 338, male, female. Syntypes: Greece; Turkey: Amasya, Brussa, Smyrna; Caucasus; and Azerbaijan: Helenendorf, now Khanlar (NHMW, Kraków).

S p e c i m e n s e x a m i n e d f r o m : Cyprus, Israel, Malta and Turkey.

R e m a r k : The species is easy to recognize, widely distributed and partly common. So it is not discussed further. See PULAWSKI (1973) for details.

D i s t r i b u t i o n : Southeastern Europe (Albania, Bulgaria, Greece), Turkey and Cyprus to Central Asia, southwards to Israel. A record from Gozo (male, 15.iii.2015 Malta, Gozo, Ramla Bay, CSE) is the first record for Maltese islands, and the westernmost finding of the species.

Ammatomus rufonodis (RADOSZKOWSKI, 1877) (figs 20-26)

Hoplisus rufonodis RADOSZKOWSKI, 1877: 41, male. Holotype or syntypes: male, Tajikistan: Zeravshan valley (ZMMU).

S p e c i m e n s e x a m i n e d : Turkey: male, female 13.vi.2000 Birecik 37.02N 37.95E (CSE); Uzbekistan: female male 5.vii.1999 W Zeravshan Mts, Dzhindydaria valley 39.12N 67.27E; 2 females 2 males 27.vii.1999 Ugan Mt. R., Sidzhaksai valley, 41.68N 70.05E; male 5.viii.1999 Tchatkal Mts., Bashkyzylsai riv. 41.18N 69.83E; male 15.vii.1999 Hissar Mt., Tashkurgan, 38.76N 67.26E (OLL). Tajikistan: male 25.6.1976; 9 males 10.6.1970, male 10.6.1990 Nurek (OLL). Oman: male 16.iv.2013 17 km W Sur (OLL); female 10.xi.2018, male female 6.v.2018 Al Mudhaibi, Samad Ashan, Aswareg 22.8259N 58.1522E (Ali Al-Jahdhami).

R e m a r k : A detailed examination of specimens formerly identified as *A. rufonodis* with the key of PULAWSKI (1973) revealed that *A. rufonodis* consists of three species. Recognition is based mainly on shape of T1, and in details of colour pattern. Each species has a different distribution area: *A. saharae* in Algeria, *A rufonodis* s.str. in Turkey, Central Asia and Oman and *A. grandcourti* in Arabia, Israel and Sudan, with the exception of a small overapping of *A rufonodis* and *A. grandcourti* in Oman. There are some similarities with the *A. mesostenus-lineage*, which is divided into four species, and each species also with a different distribution areas (and some overlapping).

D i a g n o s i s : See *A. grandcourti* and *A. saharae* for recognition of the species.

D i s t r i b u t i o n : Turkey, Armenia, Central Asia (PULAWSKI 1973), Oman.

P r e y : Ali Al-Jahdhami (pers. comm.) observed a predation of Dubas Bugs (*Ommatissus lybicus*, Homoptera: Tropiduchidae), what is a common pest on date palms in Oman.

***Ammatomus saharae* (HANDLIRSCH, 1895), stat. rev. (figs 27-28)**

Gorytes saharae HANDLIRSCH, 1895: 856, female. Holotype: female, Algeria: Mraier near Chott Melhrir (NHMW).

S p e c i m e n s e x a m i n e d : Algeria: male 8.vi.1971 Biskra (CSE).

R e m a r k : PULAWSKI (1973) synonymised *A. saharae* with *A. rufonodis*. He already mentioned the shorter T1 of the female, but he obviously gave this character no taxonomic value. In my opinion the length/width-ratio of T1 is an important distinction character on species level in the genus *Ammatomus*, because it is constant in all examined species and differs between most taxa. Even in the male of *A. saharae*, this character is pronounced and differs from *A. rufonodis*. For that reason, I restore *A. saharae* from synonmy and give it a status of a valid species. The male is described here for the first time.

D i a g o s i s : *A. saharae* is characterized by a short T1 (see key) and agree otherwise with *A. rufonodis* and *A. grandcourti*. Yellow bands of T2 and T3I are in male somewhat larger as in *A. grandcourti*. The female could not be examined. The species was only known from Algeria by two females (PULAWSKI 1973). I describe here the male for the first time. Both related species *A. rufonodis* and *A. grandcourti* are recorded from southwestern and Central Asia and from Sudan, the distribution area of these species does not overlap.

D e s c r i p t i o n o f m a l e : Body length 8.5 mm. Colour: Black. Whitish yellow are: mandible except apex and base, labrum, clypeus, space below antennal socket, short band on lower eye margin, AS I-III (remaining antenna broken), pronotal lobe and band on apical pronotal margin, spot each on mesoscutum laterally in apical corner, small spot on scutellum, metanotum, apical bands on T1-T6. Band on T1 medially emarginated, large band on sternite II, underside of fore and mid femora, tibiae, tarsi. Hindtibia black below. Hindtarsomeres I-III apically black, hindtarsomere V in apical two thirds and claws black. Wing venation brown, wings transparent. Morphology: Face including clypeus and vertex, lower mesopleuron and propodeal declivity with dense, silver pilosity, T1 1.4x. Apical transparent border of T1 0,6x as wide as yellow tergal band. Mesoscutum with large punctures, 0,5-2 diameters apart.

D i s t r i b u t i o n : Algeria.

***Ammatomus vanharteni* SCHMID-EGGER sp. nov. (figs 29-34)**

Holotype: female United Arab Emirates, 26.vi.-25.vii.2006 Al Aijban 24.36N 50.01E leg. A.v.Harten in Mailaise trap (coll CSE). Paratypes: Oman: female 25.v.2004, Muscat; Oman male 13.v.2004, Muslimat (leg. et coll. Schlaefle). Iran: 3 males 19.vii.2012 Fars, Darab 1126 m, 28’42’N 54’34’E; Iran 2 males 26.vi.2012 Fars, Darab, Navayegan 1511 m, 28’40’N 54/59’E (leg. A. Haghigi, coll CSE). Yemen: male 20.x.2005 Wadi Dawan, NW Mukalla 950 m (leg. J. Halada, coll. OLL).

D i a g n o s i s : *A. vanharteni* belongs to the *A. mesostenus* lineage and can be recognized by the following character combination: T1 is red and has apically a complete yellow band before the transparent apical margin. Body colour is whitish yellow. T1 is longer than in remaining species (see key for details).

D e s c r i p t i o n o f h o l o t y p e , f e m a l e : Body length 8.0 mm. Colour: whitish yellow are: Basal half of mandible, labrum, clypeus, space below antennal socket, short band on lower eye margin, AS I-III, pronotal lobe, spot each on mesoscu-

tum laterally in basal and apical corner, metanotum, apical band on T1, medially with V-shaped interruption, bands on T2-T5, bands on tergites IV and V does not reach tergal margin, triangular spot on S2, apical part of fore- and midfemora, tibiae, tarsi. AS X-XII, basal half of fore- and midfemora, hindfemora and large spot on innerside of hindfemora apically reddish. Apical half of hindtarsomere V and claws black. Wing venation reddish, wings transparent. Morphology: Face including clypeus and vertex, lower mesopleuron and propodeal declivity with dense, silver pilosity, T1 1.3x, mesoscutum with coarse punctation, punctures 0,3-3 diameters apart. Otherwise similar to *M. mesostenus* (see PULAWSKI 1973). Paratype females agree with holotype.

D e s c r i p t i o n o f m a l e : Body length 7.0-8.0 mm. Agree in general aspects with the female. Yellow band on T1 large, T7 with medial yellow spot. T1 1.7x as long as maximum width. Yellow colour pattern of mesosoma variable: most males with lateral band on mesosoma in whole length, pronotal apex with thin band, scutellum with medial spot or band. Male from Oman has mesosoma and scutellum black.

E t y m o l o g y : The species is named in honour of Antonius v. Harten, for his enormous contribution to the knowledge of Hymenoptera and other arthropods in the United Arab Emirates.

D i s t r i b u t i o n : United Arab Emirates, Oman, Yemen, Iran.

Ammatomus wathabensis SCHMID-EGGER nov.sp. (figs 35-40)

As *Ammatomus mesostenus* in SCHMID-EGGER (2011: 490).

Holotype: female United Arab Emirates, 26.vi.-25.vii.2006 Al Aijban 24.36N 50.01E leg. A.v.Harten in Malaise trap (coll CSE). Paratypes: 1 female same data as holotype; further material from Al Aijban: 3 females 4 males 25.vii.-7.viii.2006; 3 males 7-21-xiii.2006, 1 female 12-19.ix.2006; male 9.iv.-2.v.2006. Abu Dhabi, Al Wathba, 24.245N 54.742E: 12 females 12 males 15.xi.2014, 15.iii.2015, 15.v.2015, 15.vi.2013, 15.xi.2014;, all leg. A.v.H. in malaise traps, in coll CSE. Further material from Al Aijban, mentioned in Schmid-Egger (2011) as A. *mesostenus* and now deposited in the coll. Leiden and Berlin, was not reexamined and is not labeled as paratype.

D i a g n o s i s : *A. wathabensis* is mainly characterized by lack of the transparent lamella on apex of T1. This character differs distinctly from other species of the *A. mesostenus* lineage, which always have a transparent lamella on apex of T1. In some specimens, apex is somewhat more pale coloured than remaining tergite, but generally there is no difference in colour and structure of disc and apex of T1. This character is combined with very small lateral yellow spots on T1, a red coloured T2, a brownish apex of hindtarsomere V and claws. T1 additionally is shorter than in remaining species. This character combination makes the species unmistakable.

D e s c r i p t i o n o f h o l o t y p e , f e m a l e : Body length 8,5 mm. Colour: Yellow: mandible in basal half, clypeus, face below antennal socket, short band on lower inner eye margin, antennal segment I and II, fore- and midleg (basal parts of both legs reddish), pronotal lobe, scutellum, apical bands on T1-T5, small lateral spots on T1, a band with medial interruption on T2. Red: last flagellomeres below, hindleg, T1 and T2 (apart from yellow apical part and some black in apical half). Medial AS dark brown to reddish, sternites mostly red and partly mixed with brown, mainly in last sternites. Hindtarsomere apico-dorsally and claws brown. Remaining body black. T1 apically red, without transparent margin. Morphology. Similar to *M. mesostenus* (see PULAWSKI 1973), differs by the following characters: mesonotum, scutellum and propodeal dorsum

with fine punctation, most punctures 1–2 diameters apart, puncture diameter distinctly smaller than on mesopleuron. T1 1.1x.

V a r i a t i o n i n f e m a l e s : Body length 7.5-9.2 mm. Yellow spots on T1 lacks in some specimens, and tergite may be all red. Extension of red colour of T1I is variable and lacks in some female. Size and density of punctures of mesonotum is variable, but always finer as in *A. mesostenus*. T1 1.1x-1.2x.

D e s c r i p t i o n o f m a l e . 7-7.5 mm. The male agrees in colour and other characters with the female. In some specimens, red of T2 is replaced by black. T1 1.4x-1.5x.

E t y m o l o g y : The species is named after the type area, the Al Wathba Wetland Reserve in Abu Dhabi, UAE.

D i s t r i b u t i o n : United Arab Emirates.

Ammatomus yemenensis SCHMID-EGGER nov.sp. (figs 41-46)

As *Ammatomus mesostenus* in SCHMID-EGGER (2011: 490).

Holotype: female 3.xii.1997 – 17.ii1998 Al Kadan, leg. A.v.Harten & Massoud Nasr in malaise trap (coll Leiden). Paratype: male, same data as holotype.

D i a g n o s i s : Within the *A. mesostenus*-lineage, *A. yemenensis* is characterized by a sparse whitish body colour without red spots, and with lateral spots on T1, interrupted by a large gap. In remaining species, T1 has a continuous yellow band or a red disc.

D e s c r i p t i o n o f h o l o t y p e , f e m a l e : Body length 8.5 mm. Colour: black, whitish yellow are: clypeus, space below antennal socket, short band on lower eye margin, AS I-III, pronotal lobe, spot on mesoscutum laterally in apical corner, metanotum, lateral spots on T1, narrow bands on T2-T4, band on T4 does not reach tergal margin, triangular spot on S2, apical part of fore- and midfemora, tibiae, tarsi. Fore and midtibia with small, hindtibia with large red or black spot on underside. Mandible basally white, medially orange brown, apically black. AS XII and parts of AS XI orange-brown. Apical half of hindtarsomere V and claws black. Wing venation brown, wings transparent. Morphology: Face including clypeus and vertex, lower mesopleuron and propodeal desclivity with sparse, silver pilosity, T1 1.1x, mesoscutum with coarse punctation, punctures 0,5-1 diameters apart. Otherwise similar to *M. mesostenus* (see PULAWSKI 1973).

D e s c r i p t i o n o f m a l e : Body length 8.0 mm. Male agree with female, T1 1.7x.

D i s t r i b u t i o n : Yemen.

E t y m o l o g y : The species is named after the country of origin, Yemen.

Acknowledgements

I thank Antonius van Harten and Anita Saij for sending the material, and particularly Antonius for his constantly constructive and pleasant collaboration on the project. I am also very grateful to Mikhail Mokrousov for sending photos and material of *Ammatomus nikolajevskii*, to Ali Al-Jahdhami for sending material from Oman, and for Fritz Gusenleitner and Esther Ockermüller for the loan of specimens from the OLL collection and their support. David Baldock kindly checked the English.

Zusammenfassung

Die Grabwespengattung *Ammatomus* wird in der paläarktischen Region revidiert, ein Bestimmungschlüssel für die Arten wurde erstellt. Die folgenden Arten werden neu beschrieben: *Ammatomus aljahdhamii* nov.sp. aus dem Oman (nur Weibchen), *Ammatomus grandcourti* nov.sp. aus den Vereinten Arabischen Emiraten (VAE), Yemen, Israel, Sudan, Oman; *Ammatomus vanharteni* nov.sp. aus den VAE, Oman, Yemen, Iran; *Ammatomus wathabensis* nov.sp. aus den VAE, und *Ammatomus yemenensis* nov.sp. aus dem Yemen. Die folgenden Arten wurden aus der Synonymie in den Rang von Arten erhoben: *Ammatomus nikolajevskii* (GUSSAKOVSKIJ, 1928) (war ein Synonym von *A. mesostenus*) und *Ammatomus saharae* (HANDLIRSCH, 1895) (war ein Synonym von *A. rufonodis*). *Ammatomus asiaticus* (RADOSZKOWSKI 1886) wird erstmalig in Nordafrika und Israel nachgewiesen.

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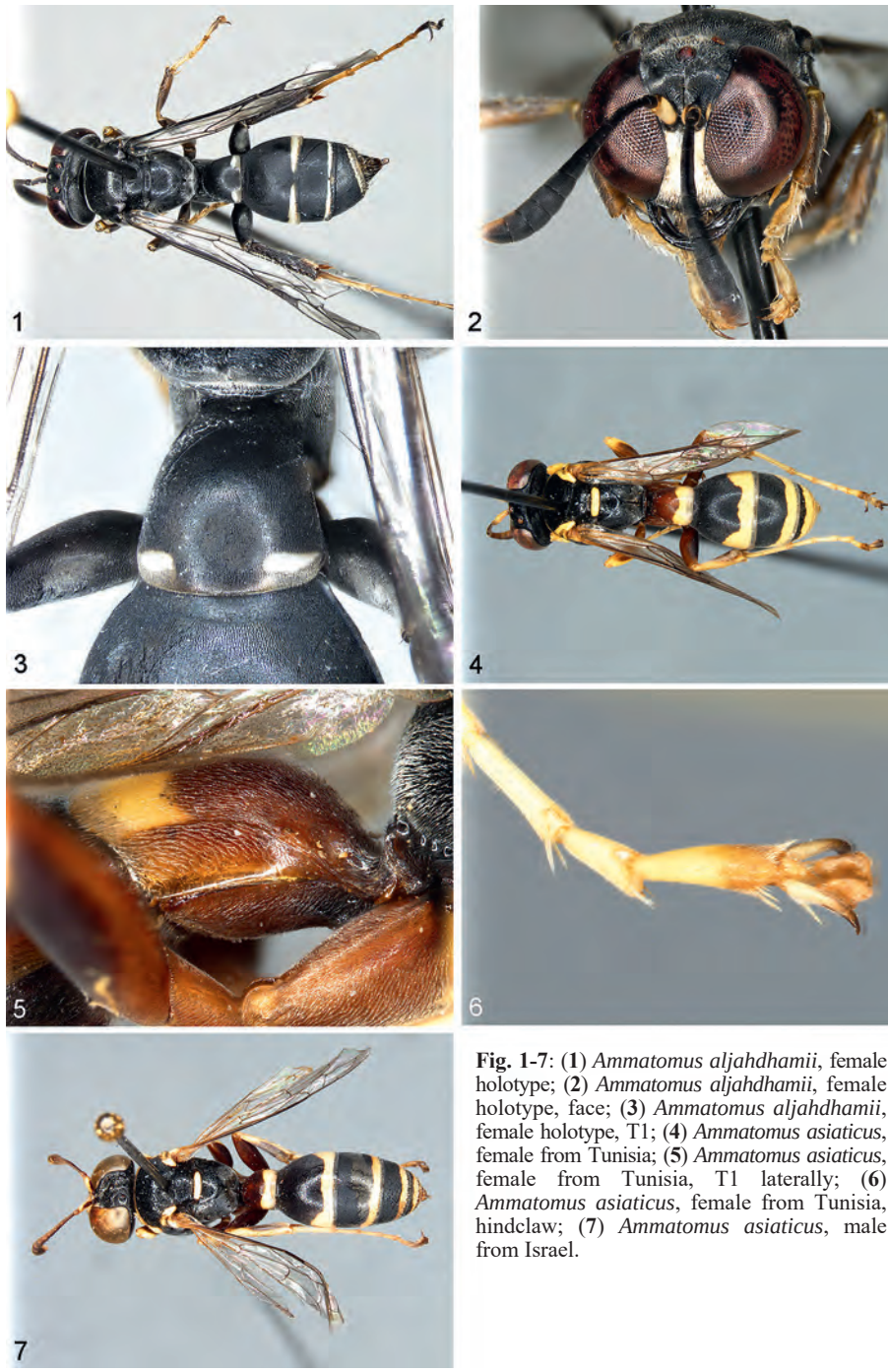


Fig. 1-7: (**1**) *Ammatomus aljahdhamii*, female holotype; (**2**) *Ammatomus aljahdhamii*, female holotype, face; (**3**) *Ammatomus aljahdhamii*, female holotype, T1; (**4**) *Ammatomus asiaticus*, female from Tunisia; (**5**) *Ammatomus asiaticus*, female from Tunisia, T1 laterally; (**6**) *Ammatomus asiaticus*, female from Tunisia, hindclaw; (**7**) *Ammatomus asiaticus*, male from Israel.

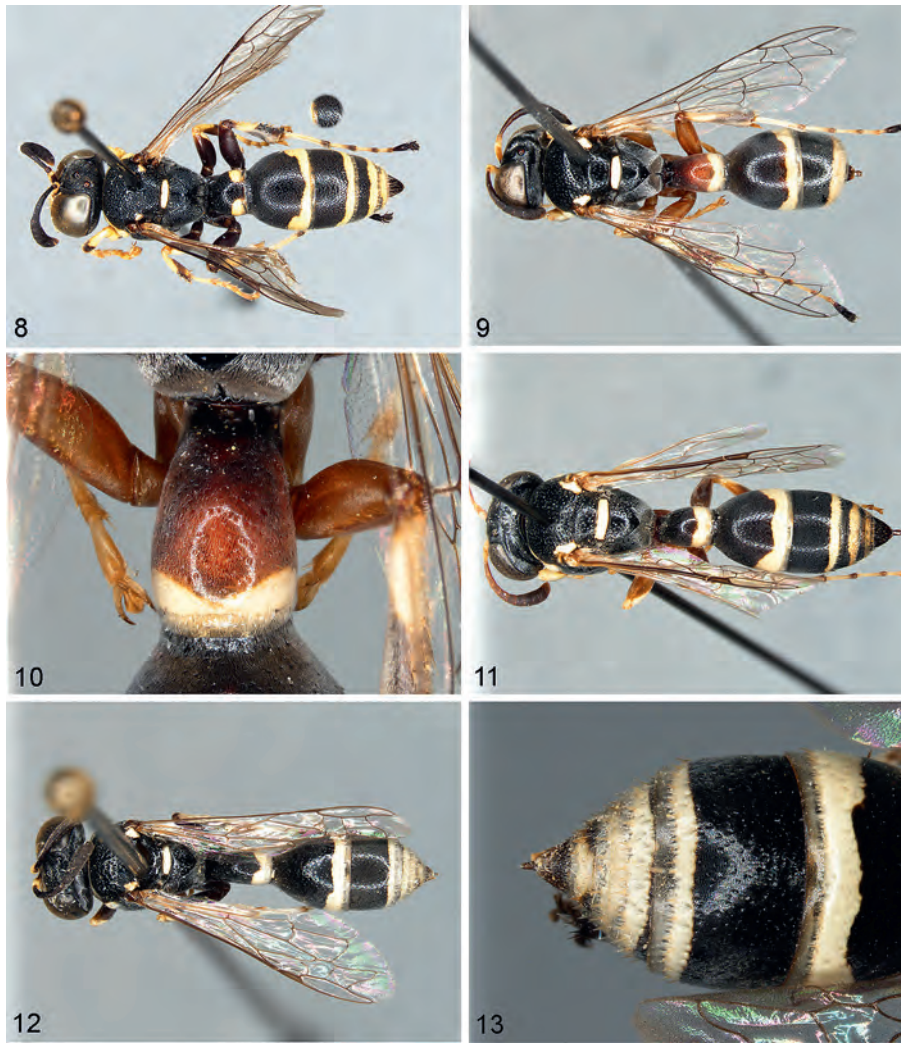


Fig. 8-13: (**8**) *Ammatomus coarctatus*, female from Rhodos; (**9**) *Ammatomus grandcourti*, female holotype; (**10**) *Ammatomus grandcourti*, female holotype, T1; (**11**) *Ammatomus grandcourti*, female from Sudan; (**12**) *Ammatomus grandcourti*, male from Israel; (**13**) *Ammatomus grandcourti*, male from Israel, tergites.

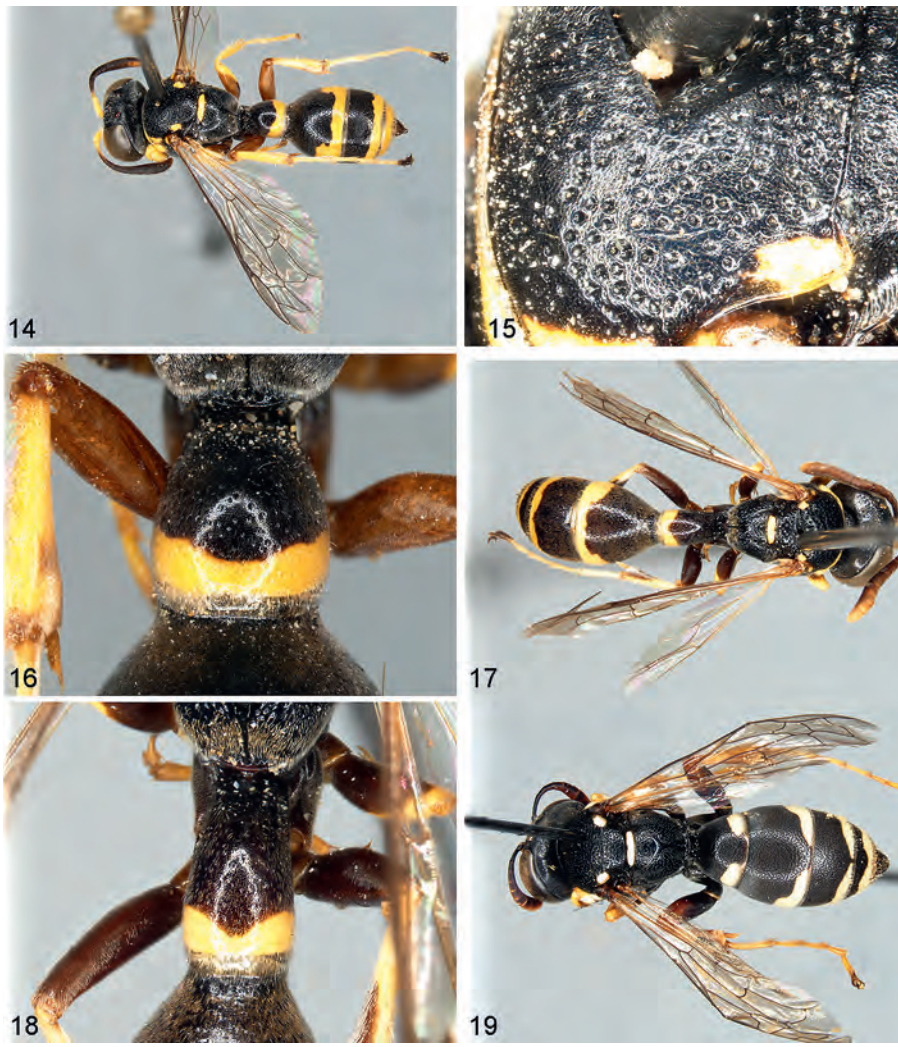


Fig. 14-19: (**14**) *Ammatomus mesostenus*, female from Tunisia; (**15**) *Ammatomus mesostenus*, female from Tunisia, mesoscutum; (**16**) *Ammatomus mesostenus*, female from Tunisia, T1; (**17**) *Ammatomus mesostenus*, male from Egypt; (**18**) *Ammatomus mesostenus*, male from Egypt, T1; (**19**) *Ammatomus rogenhoferi*, female from Turkey.

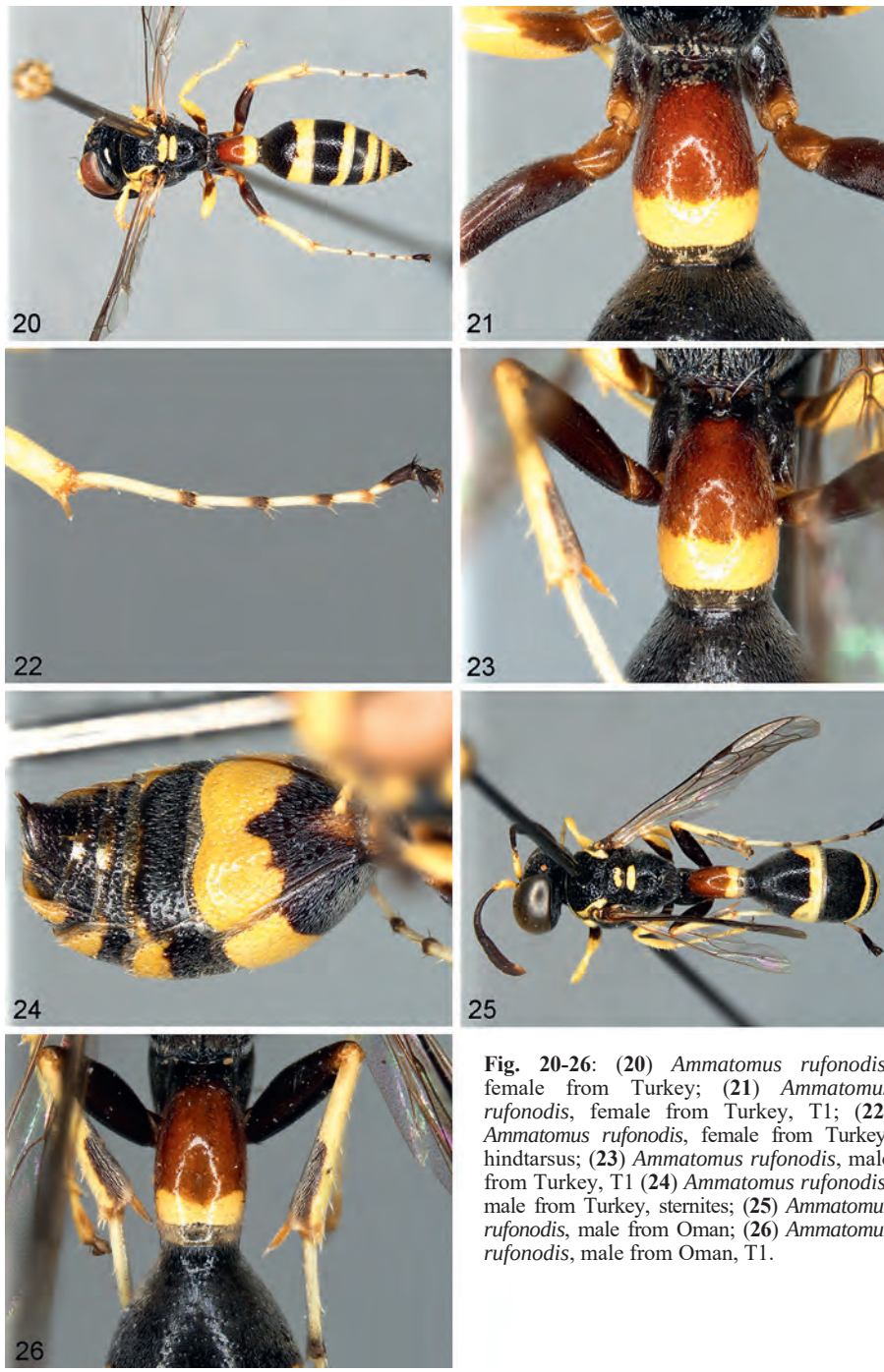


Fig. 20-26: (**20**) *Ammatomus rufonodis*, female from Turkey; (**21**) *Ammatomus rufonodis*, female from Turkey, T1; (**22**) *Ammatomus rufonodis*, female from Turkey, hindtarsus; (**23**) *Ammatomus rufonodis*, male from Turkey, T1 (**24**) *Ammatomus rufonodis*, male from Turkey, sternites; (**25**) *Ammatomus rufonodis*, male from Oman; (**26**) *Ammatomus rufonodis*, male from Oman, T1.

Fig. 27-33: (**27**) *Ammatomus saharae*, male from Algeria; (**28**) *Ammatomus saharae*, male from Algeria, T1; (**29**) *Ammatomus vanharteni*, female holotype; (**30**) *Ammatomus vanharteni*, female holotype, face; (**31**) *Ammatomus vanharteni*, female holotype, mesoscutum; (**32**) *Ammatomus vanharteni*, female holotype, T1; (**33**) *Ammatomus vanharteni*, male from Oman.

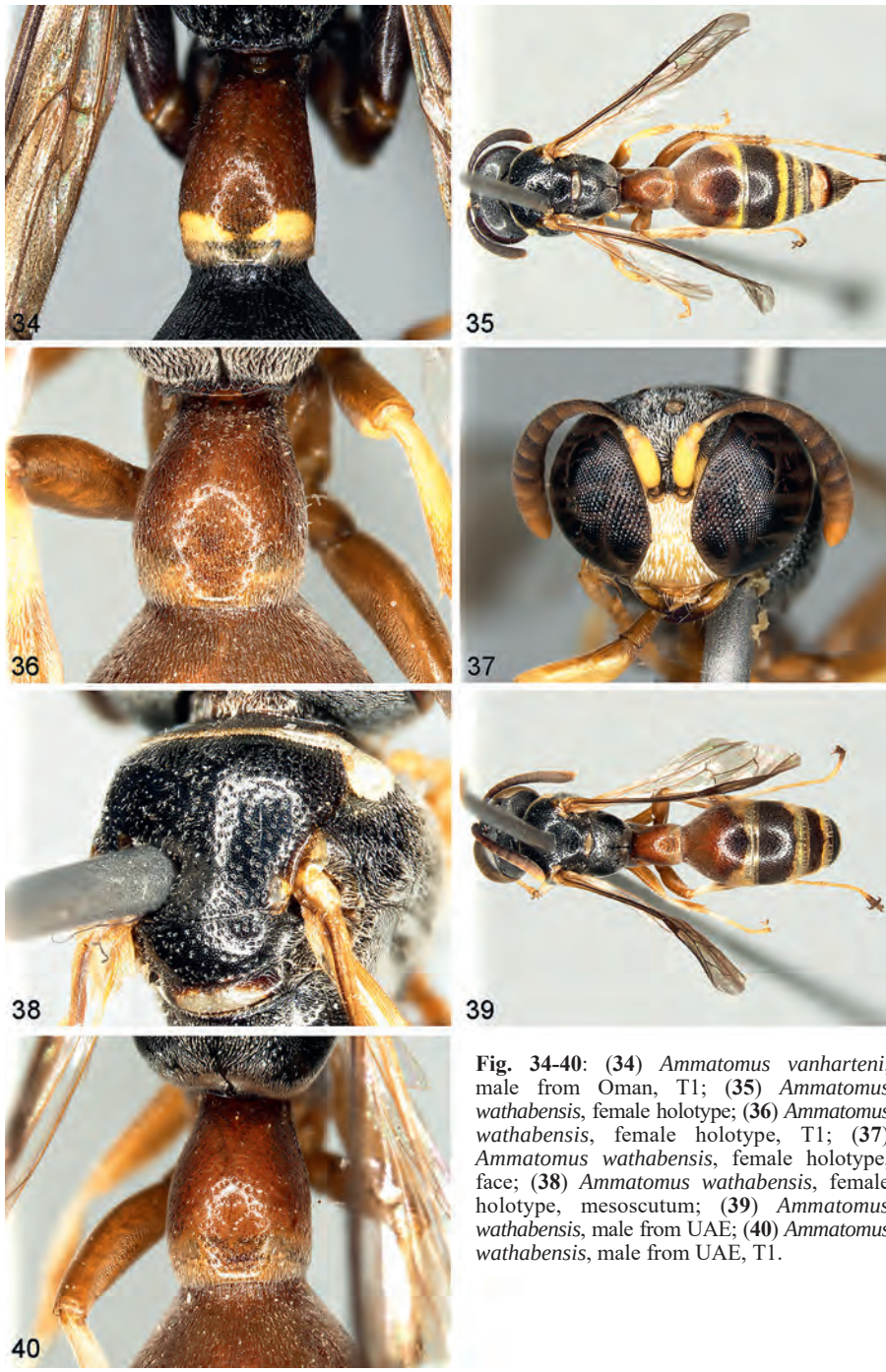


Fig. 34-40: (**34**) *Ammatomus vanharteni*, male from Oman, T1; (**35**) *Ammatomus wathabensis*, female holotype; (**36**) *Ammatomus wathabensis*, female holotype, T1; (**37**) *Ammatomus wathabensis*, female holotype, face; (**38**) *Ammatomus wathabensis*, female holotype, mesoscutum; (**39**) *Ammatomus wathabensis*, male from UAE; (**40**) *Ammatomus wathabensis*, male from UAE, T1.

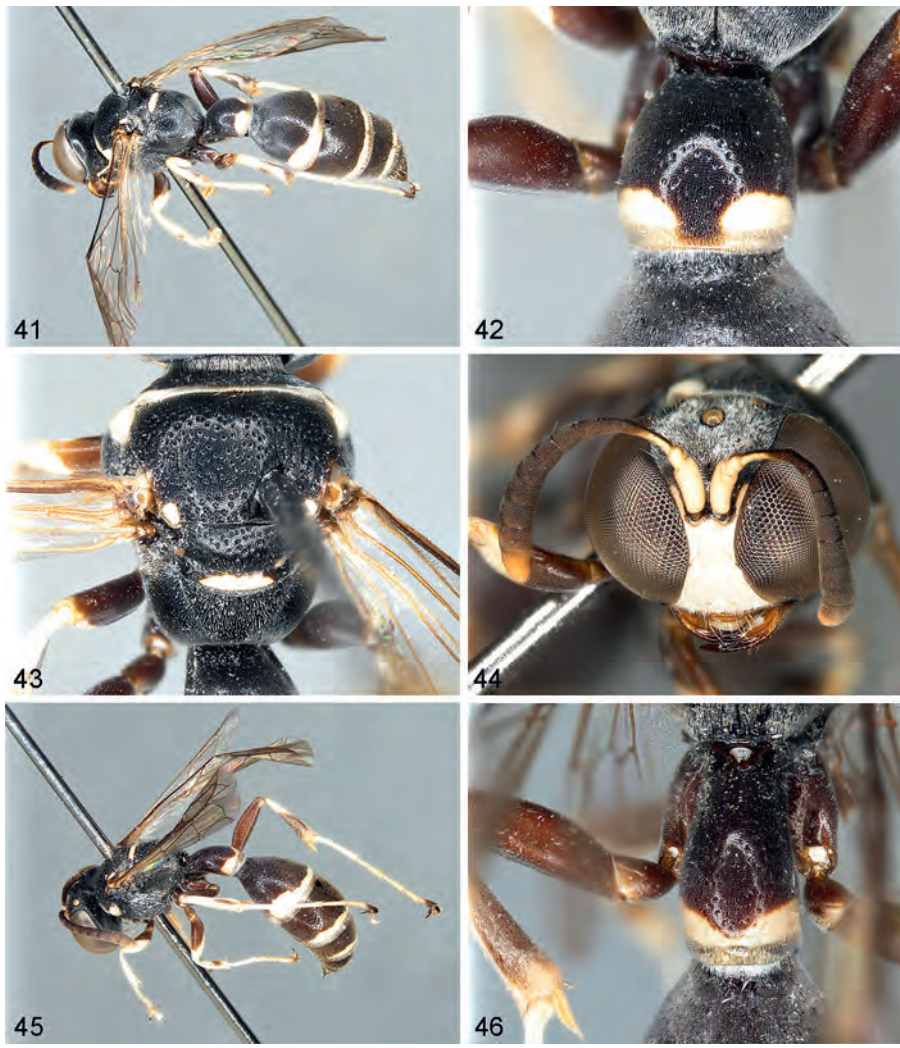
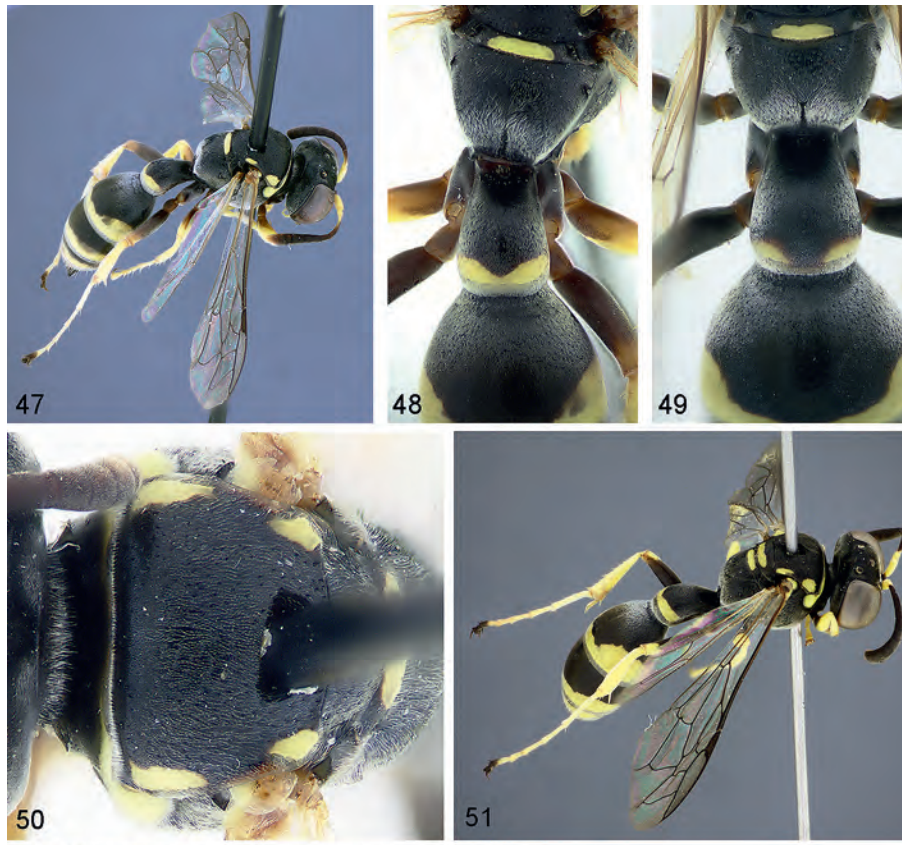


Fig. 41-46: (**41**) *Ammatomus yemenensis*, female holotype; (**42**) *Ammatomus yemenensis*, female holotype, T1; (**43**) *Ammatomus yemenensis*, female holotype, mesoscutum; (**44**) *Ammatomus yemenensis*, female holotype, face; (**45**) *Ammatomus yemenensis*, male from Yemen; (**46**) *Ammatomus yemenensis*, male from Yemen, T1.



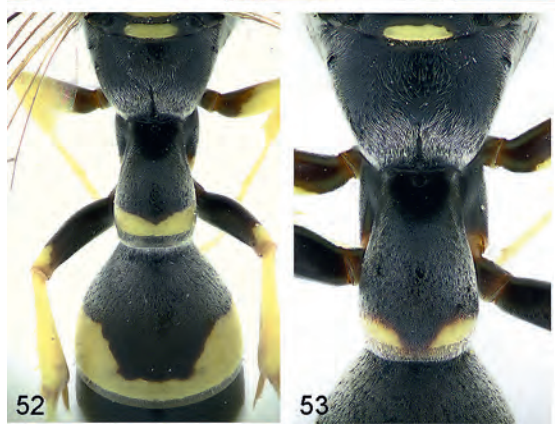


Fig. 47-53 (all from M. Mokrousov): (**47**) *Ammatomus nikolajevskii*, female from Uzbekistan; (**48**) *Ammatomus nikolajevskii*, female from Uzbekistan, T1; (**49**) *Ammatomus nikolajevskii*, female from Kalmykia, T1; (**50**) *Ammatomus nikolajevskii*, female from Uzbekistan, mesoscutum; (**51**) *Ammatomus nikolajevskii*, male from Uzbekistan; (**52**) *Ammatomus nikolajevskii*, male from Uzbekistan, T1; (**53**) *Ammatomus nikolajevskii*, male from Kalmykia, T1.