

# ON THE TAXONOMY OF THE WEST PALAEARCTIC AENICTINAE ANTS (HYMENOPTERA: FORMICIDAE)

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**Abstract.**— The types of several *Aenictus* species are studied, and differences between *A. rhodiensis* Menozzi and related species, *A. dluskyi* Arnoldi and *A. vaucheri* Emery shown. *A. maroccanus* Santschi is excluded from the genus *Aenictus* Shuchard, 1840. A first record of *Aenictus rhodiensis* from Turkey is reported.



**Key words.**— Ants, taxonomy, faunistic, Aenictinae, Ecitoninae, Palaearctic Region.

## INTRODUCTION

Genus *Aenictus* Shuckard, 1840 belongs to the monotypic ant subfamily Aenictinae. Previously Aenictinae Emery, 1901 and Ecitoninae Forel, 1893 were considered as tribes of the subfamily Dorylinae Leach, 1815, but Bolton (1990) separated Aenictinae from Dorylinae. Members of these three subfamilies, together with subfamily Cerapchyinae Forel, 1893, are collectively referred as “army ants” (or sometimes “driver ants” or “legionary ants”). All are predators, which do not have permanent nests and are nomadic (for details see Wheeler 1910, Gotwald 1982, 1995, Hölldobler and Wilson 1990). Their reproductive queens have extremely enlarged gaster and often cannot move without the help of workers. Most of species live in the tropical regions of the Old World (Aenictinae and Dorylinae), New World (Ecitoninae) or are pan-tropical (Cerapachyinae).

Workers of *Aenictus* have predominantly terrestrial habits, foraging in soil, leaf litter or on the ground surface where they hunt mainly other ants or termites. Workers are small (2.5–3.5 mm), monomorphic (with one known exception until now, see Yamane and Yoshiaki 1999), blind, yellow to brownish yellow in colour, with smooth and shiny teguments; they have a 2-segmented waist (whereas that of queens and males is 1-segmented) and 8–10 jointed antennae. Additionally they are characterized by reduced and vertical frontal lobes, so that antennal sockets are completely exposed and almost fused, and by an inflexible promesonotum

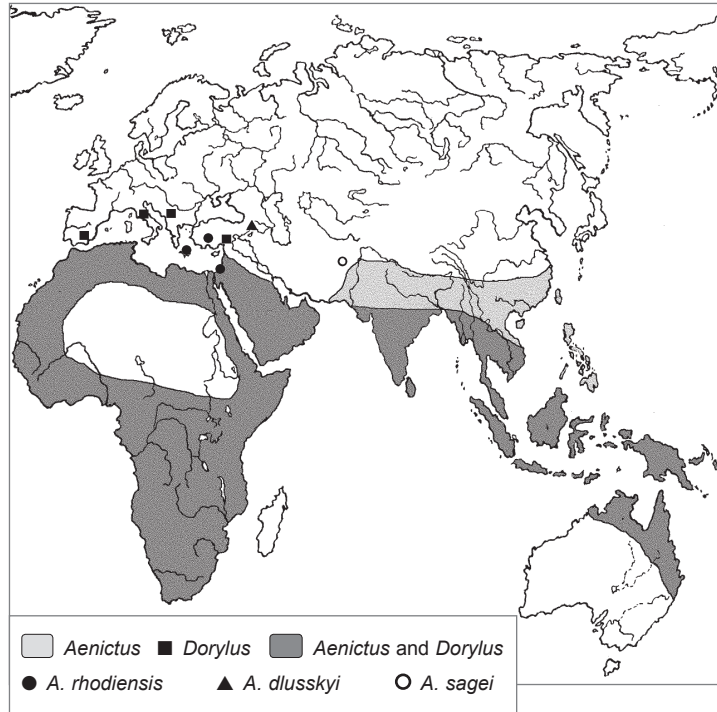


Figure 1. An outline of the known distribution of *Aenictus* and *Dorylus*.

with vestigial to absent promesonotal suture (see also Bolton 1994, Aktaç and Radchenko 2002).

The distributional area of *Aenictus* widely overlaps that of *Dorylus*, and includes Africa (except for the most arid regions of Central Sahara, and Madagascar), Saudi Arabia, Southern and South-Eastern Asia (including Southern China, Taiwan and southern Japanese islands), North-Eastern Australia, Philippines, Indonesia and New Guinea (Fig. 1).

At present, more than 150 species and infraspecific forms of *Aenictus* have been described, about 60 of which are known from Africa, the others – from Asia and Australia. Only one species, *A. rhodiensis*, has been described from Europe (Rhode Island). In the Palaearctic more than 10 species are known, nine of which are distributed in the western part (from Morocco to Afghanistan), and only a few species penetrate to the south-eastern part of Palaearctic.

A complete taxonomic revision of *Aenictus* has never been made, but recent investigations were provided for the Oriental Region (Wilson 1964, Terayama 1984, Terayama and Yamane 1989, Terayama and Kubota 1993, Xu 1994, Zhang 1994, Hashimoto and Yamane, 1999, Zhou et al. 1999). A full revision will be quite difficult because about 80 species and subspecies are described only from males: the reason for this is that males of *Aenictus* are very big (up to 25 mm) and robust, and at night often fly towards light making them much easier to collect compared to finding temporary nests (bivouac) or even foraging workers.

## MATERIAL

The types of *Aenictus* species investigated were:

*A. rhodiensis* Menozzi, 1936, syntypes, 3 workers, "Cottavia, Rhodi, 1.iv.1924, C. Menozzi" (Istituto di Entomologia, University di Bologna, Italy).

*A. dlusskyi* Arnoldi, 1968, paratypes, 6 workers, "Armenia, Dzhrvezh near Yerevan, 3.vi.1960, No. 1040, G. Dlussky" (Zoological Museum of the Moscow State University, Moscow, Russia).

For the comparison the following material was studied:

2 workers of *A. vaucheri* Emery, 1915 [workers described by Santschi (1936)] from Morocco, "Ito, 4 Mai [19] 29, A. They", "Typus", "*Aenictus vaucheri*", "Sammlung Dr. F. Santschi, Kairouan" (Naturhistorisches Museum Basel, Switzerland). This species was described by Emery from queens, and Santschi described workers; surely, Santschi's "types" of workers mentioned above are not types according to the last editions of the Code of Zoological Nomenclature.

Holotype worker of *A. maroccanus* Santschi, 1936, "Maroc, Rabat, A. They", "*Aenictus* sp. n. *maroccanus*", "Type", "Sammlung Dr. F. Santschi, Kairouan" (Naturhistorisches Museum Basel, Switzerland) (for this specimen see note below).

## METHODS

Various morphometrics of a sample of the specimens were measured (accurate 0.01 mm), and several indices were calculated from these. The following abbreviations are used:

**Morphometrics:** HL – length of head in dorsal view, measured in a straight line from the anterior point of median clypeal margin to mid-point of the occipital margin; HW – maximum width of head in dorsal view; SL – maximum straight-line length of antennal scape seen in profile; AL – diagonal length of the alitrunk seen in profile, from the neck shield to the posterior margin of metapleural lobes; HTL – length of tibia of hind leg; PNW – maximum width of pronotum from above in dorsal view; PL – maximum length of petiole from above; PPL – same of postpetiole; PW – maximum width of petiole from above; PPW – same of postpetiole; PH – maximum height of petiole in profile; PPH – same of postpetiole.

**Indices:** Cephalic (CI) = HL / HW; Scape (1) (SI<sub>1</sub>) = SL / HL; Scape (2) (SI<sub>2</sub>) = SL / HW; Petiole (1) (PI<sub>1</sub>) = PL / PH; Petiole (2) (PI<sub>2</sub>) = PL / HW; Postpetiole (1) (PPI<sub>1</sub>) = PPL / PPH; Postpetiole (2) (PPI<sub>2</sub>) = PPL / PPW

## RESULTS

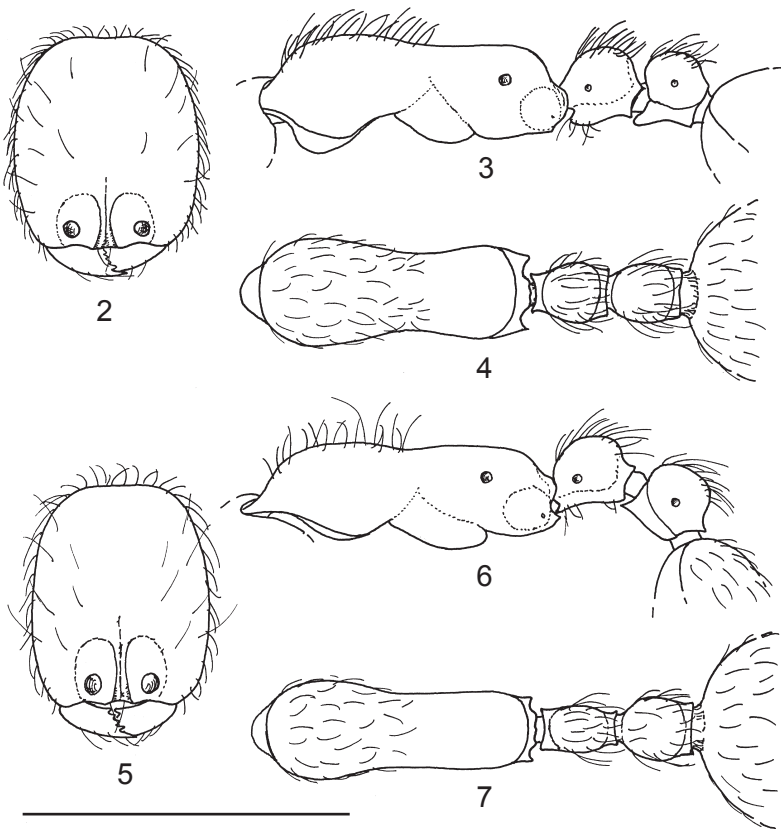
*Aenictus rhodiensis* was found by the authors of this paper in Southern Turkey [Adana Province, Taurus Mts. (Bolkar Dagi), 7 km east of Pozanti, 37°26' N, 34°52' E, 1240 m a.s.l. 29.vi.2001, coll. No. 01-0492 (NA), 64-01 (AR). The bivouac of this species was under big stone in old mixed pine and *Cedrus* sp. forest; in total several hundred workers were collected.

Workers of *A. rhodiensis* and *A. dlusskyi* well differ from those of *A. vaucheri* by distinctly elongate postpetiole (seen from above), which is transverse in the latter species (PPI<sub>2</sub> > 1.10 versus < 0.90) (compare also Figs 2–7 and 8–10).

Generally, *A. rhodiensis* and *A. dlusskyi* are very similar, and separating them is quite difficult. Furthermore, males of both species and queens of *A. rhodiensis* are unknown, and additional material is required before one can form definitive opinions about relationships or even possible synonymy of these two species.

However, the majority of measurements and indices of *A. rhodiensis* and *A. dlusskyi* greatly overlapped (Table 1). We found only several more or less distinct differences between these species: *A. rhodiensis* has lower and narrower postpetiole than *A. dlusskyi* (PPI<sub>1</sub> 0.95–1.06, mean = 0.99 versus 0.81–0.94, mean = 0.88; PPI<sub>2</sub> 1.24–1.36, mean = 1.31 versus 1.12–1.22, mean = 1.18), and differences in the shape of ventral petiolar processes. This process in *A. dlusskyi* is somewhat less developed and forming sharp teeth anteriorly while in *A. rhodiensis* it is somewhat wider and blunt anteriorly (compare Figs 2–4 and 5–7). The species also slightly differ by the density and length of body hairs, shape of head and alitrunk, colour, etc., but these features are quite variable and impossible to say this might be intra-, or interspecific variation.

*A. dlusskyi* is known only from the type locality (Armenia) in spite of many attempts by one of the



Figures 2–7. Details of structure of *Aenictus rhodiensis* (2–4) (syntype, worker) and *A. dluskyi* (5–7) (paratype, worker). (2, 5) Head dorsal view; (3, 6) alitrunk and waist in profile; (4, 7) alitrunk and waist, dorsal view. Scale bar = 1 mm.

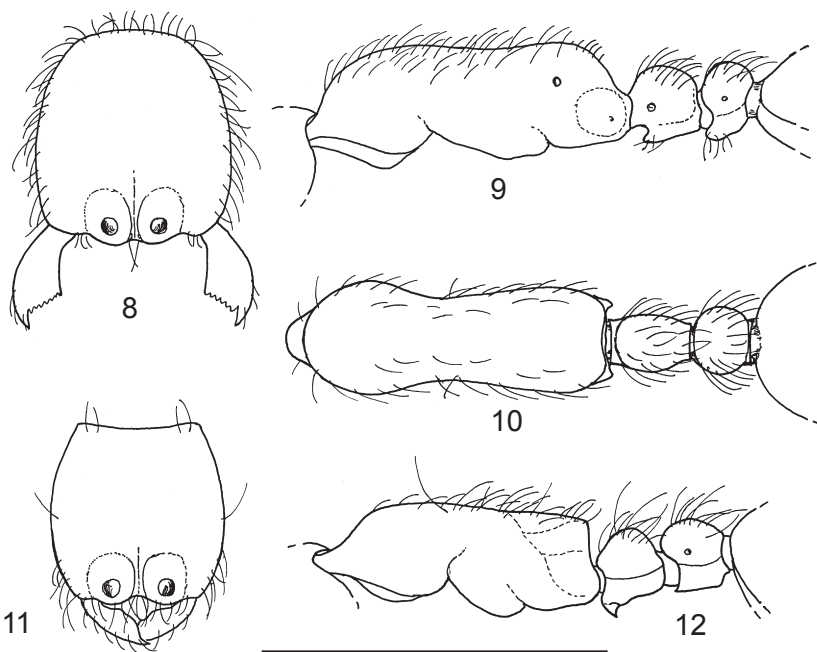
authors (AR) to collect it again in different places in Armenia, including exact type locality of Dzhrvezh. However, the record of *A. rhodiensis* in southern

Turkey is the third known locality for this species [it was referred by Kugler (1988) for Israel]. On the one hand, these records confirm that *Aenictus* appears to be widely distributed and in the East Mediterranean Region (in the widest sense, including Iran, Transcaucasus, probably Central Asia), but its species have cryptic habit. On the other hand, *Aenictus* in West Palaearctic Region appears to be a relict species, and inhabit locally less destroyed habitats.

As mentioned above, we studied holotype worker of *A. maroccanus* Santschi. Really this specimen does not belong to the genus *Aenictus* and even to the subfamily Aenictinae. It is blind, has 2-segmented waist, 12-jointed antennae; its spiracles are situated distinctly in front of midlength of the postpetiole (in *Aenictus* they are behind or about midlength of postpetiole), the petiole ventrally has a sharp dent directed backwards; its head and alitrunk are densely finely punctured, appearing matt while the whole body is brown in colour (Figs 11–12). All these features led us exclude *A. maroccanus* from *Aenictus*. Unfortunately, the specimen is partly damaged (it has not any tarsi and part of legs), and we could not identify it exactly, but with no doubt it belongs to the subfamily Ectoninae. We may only suppose that specimen of *A. maroccanus*

Measurements and indices	<i>A. rhodiensis</i> (syntypes) n=3		<i>A. rhodiensis</i> (Turkey) n=25		<i>A. dluskyi</i> (paratypes) n=6	
	Range	Mean	Range	Mean	Range	Mean
<b>Measurements</b>						
HL	1.22–1.26	1.23	1.10–1.26	1.17	1.16–1.30	1.24
HW	1.00–1.04	1.02	0.82–1.06	0.94	0.90–1.10	1.00
SL	0.70–0.73	0.72	0.58–0.74	0.64	0.66–0.74	0.70
AL	1.72–1.78	1.75	1.54–1.82	1.71	1.74–1.90	1.81
HTL	1.00–1.06	1.03	0.82–1.04	0.94	0.96–1.06	1.01
PNW	0.64–0.68	0.67	0.56–0.68	0.62	0.60–0.68	0.66
PL	0.48–0.52	0.51	0.44–0.54	0.49	0.46–0.54	0.51
PW	0.31–0.32	0.32	0.30–0.36	0.32	0.30–0.36	0.33
PH	0.38–0.40	0.39	0.34–0.42	0.38	0.38–0.44	0.41
PPL	0.38–0.40	0.39	0.34–0.43	0.39	0.34–0.44	0.40
PPW	0.29–0.30	0.30	0.26–0.34	0.34	0.28–0.36	0.34
PPH	0.40–0.42	0.41	0.34–0.44	0.39	0.42–0.50	0.45
<b>Indices</b>						
CI	1.20–1.22	1.21	1.20–1.34	1.25	1.18–1.29	1.24
SI <sub>1</sub>	0.57–0.59	0.58	0.53–0.61	0.58	0.56–0.57	0.57
SI <sub>2</sub>	0.70–0.71	0.71	0.67–0.74	0.71	0.63–0.72	0.69
PI <sub>1</sub>	1.26–1.33	1.30	1.22–1.29	1.26	1.19–1.32	1.25
PI <sub>2</sub>	0.48–0.51	0.50	0.51–0.54	0.52	0.49–0.53	0.51
PPI <sub>1</sub>	0.95–0.97	0.96	0.95–1.06	1.00	0.81–0.94	0.88
PPI <sub>2</sub>	1.31–1.33	1.32	1.24–1.36	1.30	1.12–1.22	1.18

Table 1. Measurements (in mm) and indices of *Aenictus* species (workers).



Figures 8–12. Details of structure of *Aenictus vaucheri* (8–10) (syntype, worker) and *A. maroccanus* (11, 12) (holotype, worker). (8, 11) Head dorsal view; (9, 12) alitrunk and waist in profile; (10) alitrunk and waist, dorsal view. Scale bar = 1 mm.

was mislabelled and really it was found somewhere in South or Central America. Of course, one could also speculate that this is a native member of Ecitoninae, probably new genus or even new subfamily, but this could be resolved if more material was found.

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