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Monograph: Brief Survey of Palearctic Species of the Genus Eumerus Mg. (Diptera, Syrphidae)

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Foreword

Eumerus Mg. is a fairly limited genus in distribution, being very widely distributed in the Old World, Australia, and Oceania, but, interestingly, being represented in the New World by hardly any species -- only two or three confirmed species, in North America. More than 90 species of the genus are known in the Palearctic, at least 35 in the Ethiopian region, at least 40 in the Oriental region, and 10 in Australia and Oceania. Within the Palearctic the genus Eumerus is most richly developed in the Mediterranean subregion considered broadly (/i.e.,/ including Central Asia).

We still know very little about the form of life of the larvae of Eumerus. As far as is known, they inhabit the juicy tissues of grassy plants, mainly Liliaceae, stems of Orobanchaceae, particularly the giant desert Cistanche (inhabited by certain Central Asian and West Asian spe-

cies of Eumerus), the roots of Compositae, e.g. the goat's beard, Tragopogon (inhabited by Eumerus ovatus Lw., and Eu. tricolor Lw.), the roots of the seed plants of carrots (Eumerus sogdianus Stack. and Eu. strigatus Flln.), and the like. Certain species produce substantial agricultural damage; Eu. strigatus Flln. and Eu. tuberculatus Rd., in particular, are very widely distributed in the Palearctic, and they damage garden plantings of onions.

Eumerus is the central genus in the subfamily Eumerinae. A number of other tropical genera beside Eumerus have been regarded as being in this subfamily (Hull, 1949), namely Azpeytia Walk. (with 6 Oriental species), Megatrigon Johns., and Amphoterus Bezzi, with each /of the latter two/ having one Ethiopian species. However, the possibility has not been eliminated that another genus should be included in the subfamily Eumerinae, namely the large and important Palearctic genus Lampetia Mg. (= Merodon Mg.), the classing of which in the subfamily Eristalinae is unnatural and unjustified. In support of this opinion are the fact that the aggregations of small spines in the base part of the lower surface of all three pairs of thighs are incompletely developed in Lampetia, although this feature is very characteristic of typical Eristalinae; and also the fact that the form or mode of life and the basic structural features of the larvae are more or less similar in Eumerus and Lampetia but sharply different between Lampetia and present Eristalinae (e.g., Eristalis, Tubifera, and related genera). The similarity of Eumerus and Lampetia has already been noted by Smirnov (1923), and has been confimmed by Glumac (1960).

The present survey of the Palearctic species of the genus Eumerus is an attempt to present a practical determining table for them. The need for such a table has increased with the description of a large num-

ber of new species of Eumerus from within the USSR, mainly Central Asia (Stackelberg, 1949 and 1952) and the Caucasus (Stackelberg, 1960).

The proposed determining table does not reflect the phylogenetic relations of the species. The author has attempted to use convenient and simple features, without presuming to confer a phylogenetic character on the table. This was not really possible, since the author did not have the opportunity to study certain Mediterranean species which are absent from the collections to which he had access.

The author was greatly assisted in this work by the loan of many types of species described by Th. Becker, by /permission of/ Prof. Dr. F. Peus, Zoologisches Museum, Humboldt Universitaet, Berlin, D.D.R., to whom the author's sincere thanks are due. The author is also grateful for the assistance of the artist L.V. Chernysheva, who executed the major part of the drawings in the work.

Diagnosis of the Genus

The average sized insect is stocky with more or less thick rear thighs which have spines on the lower side. The face is even, without projections. The body is a dark metallic green. The abdomen in some species is partly red; in most species /i.e., most of the total number, presumably/ there are 3 pairs of spots with a light coating. The predistal division of m (= distal cross-vein) in the distal division at r_{4+5} has reversed direction. In the Palearctic there are over 90 species. The larvae are found on onions, lilies, rhizomes of Orobanchaceae, Compositae, etc. The genus is very well developed in the Mediterranean region and in Central Asia; in the central and particularly in the northern zone of the USSR only a few species are represented.

Determining Table

Males

1 (46) Abdomen over its entire extent or in part is red or reddish yellow, or else the 2nd or 3rd tergite has yellow or red spots on the sides.

2 (21) Eyes are contiguous, over a more or less significant (sometimes short) length.

3 (14) Antennae are black or black-brown.

4 (7) Eyes are naked or nearly naked.

5 (6) Basal segments of the fore and middle tarsi are yellow or reddish yellow, with a long, stiff bristle on their distal end. The basal third of the tibiae is yellow. Hind femora have relatively short white hairs on their underside, the length of which hairs is approximately equal to half the diameter of the femur. -- Eyes of the male are contiguous over a very short distance, equal to approximately one fourth the height of the front. Mesothorax is black, with coarse /i.e., relatively large/ and dense dots /sic -- these may have the nature of nodules/; it is slightly shiny, and has short brownish hairs which lie down. Legs are black; /but/ the basal third of the tibiae and the 3 to 4 basalmost segments of the fore and middle tarsi are yellow. The abdomen is entirely deep red or its caudal end is black /sic -- i.e., "or deep red with caudal end black"/. 7 to 8 mm. USSR: Central European parts (Orlovskaya oblast'). Transcaucasus (Armenia). Central and southern Europe. Not often /encountered/.

..... E. tarsalis Lw. 1848. Loew 1848:113; Sack 1932:417.

6 (5) Fore and middle tarsi are black /right/ up to the basal end, and have short bristles at the distal end of each segment. Tibiae are a narrow /sic -- i.e., monochrome/ yellow at the basal end. Hind femora in their middle part on the underside have very long white

hairs, the length of which exceeds the width of the femur in the corresponding location. -- Eyes of the male contiguous over a very short distance, equal to about one fourth of the height of the front (Fig. 1). Mesothorax is black with a bluish iridescence, has coarse, dense dots, is slightly shiny, and has very dense but short, upright, yellowish hairs. Legs are black; hind femora have very long, white, upright hairs on the underside. Wings are transparent; wing ocellus black-brown. Abdomen is red, with basal and caudal ends black, and crescent shaped spots of a white coating on the 2nd to 4th tergites. 7 mm. USSR:Transcaucasus (Armenia).
..... E. armenorum Stack. 1960. Stackelberg 1960:444.

7 (4) Eyes have dense, long hairs.

8 (9) Face has long, dense, black hairs. Mesothorax has long, dense, fluffy /i.e., plumose/ black hairs. -- Body is black; mesothorax has dense but small dots, is a black-blue, and is shiny; abdomen has a red spot on each side of the 2nd and 3rd tergites; top side of the caudal half of the abdomen has fairly long semi-lying-down silvery-white hairs. Legs are black; base of tibiae is a narrow /sic/ yellow. Wings are transparent; r_{4+5} over R_5 is strongly bent /i.e., curved/ (Fig. 2). 8 to 10 mm. USSR: Central Asia (subalpine regions of the Gissarskiy mountains, eastern Pamir).
..... E. ursiculus Stack. 1949. Stackelberg 1949:427.

9 (8) Face has dense, white hairs. Mesothorax has long, dense, whitish or yellowish hairs.

10 (11) Second tergite alone has a yellow triangular spot on /each/side. -- Body is a bronze-green. Eyes contiguous over a distance approximately half the height of the frontal triangle; face and front are narrow (Fig. 3), covered with a grayish white coating. Antennae

black; 3rd segment nearly diamond shaped (Fig. 3). Mesothorax has barely noticeable longitudinal bands of a gray coating on its cephalad half; hairs of the mesothorax are long, dense, white, and upright. Legs a black-bronze color; distal end of femora and basal third of tibiae are yellow. Abdomen elongated; 2nd to 4th tergites have pairs of gray spots which are strongly bent in their middle and which widen out like drops in the medial part /of the tergite/. 11 to 12 mm. Mongolia (Gobi Desert).

..... E. kozlovi Stack. 1952. Stackelberg 1952:374.

Fig. 1. Eumerus armenorum Stack. Male.

1 - Head, top aspect; 2 - Hind leg.

-- from Stackelberg

Fig. 2. Eumerus ursiculus Stack. Male. Original /i.e., drawing is new with this journal article/

11 (10) 2nd and 3rd tergites of abdomen have a large red spot on each side.

12 (13) 3rd and 4th tergites of abdomen have relatively long, silvery white hairs which lie down. -- Eyes have long, dense white hairs, and are contiguous over an extent approximately equal to one half the height of the frontal triangle. Middle back is blackish blue, with frequent but small dots and is shiny, with long, dense, upright white hairs; in the front of the middle back there are barely noticeable spots of a white coating. Legs black; basal third of tibiae yellow. r_{4+5} over R_5 distinctly curved /also means "bent"/. Abdomen black, with large red spots on the sides of the 2nd, 3rd, and sometimes the 4th tergite, and with crescent shaped spots of a white coating on the 2nd to 4th tergites; hypopygium /referring apparently to the last abdominal sternite/ has long white hairs. 6 to 9 mm. USSR: Central and southern European parts. Central and southern Europe. Larvae in the roots of goat's-beard.

..... E. ovatus Lw. 1848. Loew 1848:109; Sack 1932:410.

Fig. 3. Eumerus kozlovi Stack. Male.

1 - Front view of head; 2 - Antenna.

-- from Stackelberg.

13(12) 3rd and 4th tergites covered in large part with short black hairs which lie down. Eyes have rather dense and long white hairs, and

are contiguous over an extent approximately equal to one half the height of the frontal triangle. Middle back is black, with dense, coarse dots, faintly shiny, with short, upright, yellowish brown hairs, and with two longitudinal bands of a white coating. Legs black; tibiae yellowish brown near the base. r_{4+5} over R_5 distinctly curved /also means "bent"/. Abdomen black, with large dark red spots on the sides of the 2nd and 3rd tergites, and with crescent shaped spots of a white coating on the 2nd to 4th tergites; hypopygium has black hairs. 8 to 9 mm. USSR: Transcaucasus (Armenia). Central and southern Europe.

..... E. annulatus Pz. 1798. Loew 1848:112; Sack 1932:410.

14 (3) Antennae reddish yellow.

15(16) Greater part of legs and abdomen yellow. -- Eyes uncovered, contiguous over an extent approximately equal to three fourths of the height of the front; front and face have silvery white hairs; antennae yellow. Thorax has thick, gray coating; middle back has four longitudinal bands with a bronzish metallic luster. Legs yellow; hind femora have a dark spot on the top side of the distal /lit., "tip"/ half, and the bottom side of the distal half has a dense ridge of spines. Abdomen is yellow, often with caudal part darker, and has crescent shaped spots of a white coating on the 2nd to 4th tergites, all with very short hairs which lie down; hypopygium is black with a gray coating, and has yellow hairs. 8 to 10 mm. USSR: Turkmeniya (Kopet-Dag), western Pamir. Iran.

..... E. jacobsoni Beck. 1913. Becker 1913, Yezhegodn. Zoolog. Muzh. AN (Yearbook of the zoological museum of the Academy of Sciences) XVII:603; Sack 1932:402.

16(15) The legs for the most part black. Abdomen black, with large red spots on the side, or else for the most part red.

17(18) Eyes with long, dense hairs. -- Eyes contiguous over a short extent. Middle back has soft and non-dense dots; it is shiny, has upright white hairs, and in the fore half has two weakly developed longitudinal bands of a white coating. The legs black; proximal half and distal end of tibiae yellow. Abdomen black, but with side sections /sic/ of the 2nd and 3rd tergites red, and with large crescent shaped spots of a white coating on the 2nd to 4th tergites; hypopygium brown with white hairs. 8.5 to 12.5 mm. Northeast Africa.

..... E. mucidus Bezzi 1921.

(Footnote: E. compertus Villeneuve is close to this species. The former was also described as from North Africa (Bull. Soc. Hist. Nat. Afrique du Nord, IV, 1924:68). Judging from the description (Villeneuve 1924, Sack 1932) it differs from E. mucidus Bezzi by having black hairs on the hypopygium.)

Efflatoun 1922:107-109; Id. 1926; Bull. Soc. Entom. Egypte, X:301.

18(17) Eyes naked or practically naked.

19(20) Length of the line of contiguity of the eyes is approximately equal to the height of the frontal triangle. Tibiae and tarsi of the fore and middle legs are in large part yellow; hind femora are very markedly thickened (Fig. 4).--Face, forehead, and peak part of the vertical triangle covered with a dense silvery-white coating and white hairs. Middle back black-blue, with coarse, frequent dots, weakly shiny, with very short, semi-lying-down, brown hairs. Femora, except for their distal ends, and hind tibiae on

their distal halves (i.e., of the tibiae), are black. Abdomen red, with 3 pairs of crescent shaped spots of a white coating on the second to fourth tergites, and with very short hairs which lie down; hypopygium red, with white hairs. 8 to 9 mm. Africa.

..... E. lunatus F. 1794. Curran 1938, Amer. Mus. Novitates, 1009:8.

20(19) Length of line of contiguity of eyes does not exceed half the height of the frontal triangle. Legs black. (Fore tarsi lacking in this type.) Hind femora moderately thickened (Fig. 5). -- Face and forehead have gray coating and white hairs. Middle back black, with coarse and frequent dots, weakly shiny, and with relatively short, upright, yellow hairs. Legs black; joints "narrowly" yellowish. Abdomen red, with 3 pairs of crescent shaped spots of a white coating on the 2nd to 4th tergites, and with very short hairs which lie down; hypopygium black, with black hairs. 10 mm. USSR: Transcaucasus (Armenia).

..... E. urartorum Stack. 1960. Stackelberg 1960:445.

21 (2) Eyes either contiguous at only a point or else separated more or less by a wide forehead /i.e., front/.

22(33) In the distal half of the wing there is a large, clearly developed, dark, smoky spot.

23(24) Eyes contiguous at a single point. Hind tibiae, in their distal halves, and hind tarsi on their external sides, have clumps of dense, long black hairs. -- Eyes have dense hairs. Antennae are light yellow. Middle back has short white hairs. Legs & black; basal & distal ends of tibiae yellow. Abdomen well-proportioned, relatively thin, cylindrical, and black; 2nd and 3rd tergites have red spots on their sides. 10 mm. USSR: Transcaucasus (Ar-

menia).

..... E. kazanovskiae Par. 1927. Paramonov 1927, Soc. Entom., 41:20; Sack 1932:402.

24(23) Eyes separated more or less by a wide frontal area. Hind tibiae and tarsi lack clumps of long black hairs.

25(28) Antennae reddish brown or yellowish brown.

26(27) Eyes have very long, dense white hairs. Middle back has two bands of a white coating extending longitudinally in its forward half. Abdomen has a small yellowish brown triangular spot on the side of its 2nd tergite. -- Body is black. Middle back has small dots, not densely spaced; it is shiny, has long, dense, upright, plumose, whitish hairs, and in the forward half it has 2 longitudinal bands of a white coating. Legs are black, with long white hairs; proximal half of tibiae is yellow. Wings have a large brown smoky spot distally /lit., "outwardly"/ beyond the junction /in/ $r_{2+3} + r_{4+5}$. Abdomen is black with more of a metallic sheen, and has wide crescent shaped spots of a white coating on the 2nd to 4th tergites; abdomen and hypopygium have long whitish hairs. 11 to 13 mm. USSR: Turkmeniya -- sandy deserts. Larvae infest stems of Cistanche; and adult insects are found on the flowers.

..... E. ammophilus Par. 1927. Paramonov 1927, Tr. Fiz.-Mat. Vidd. Ukr. AN, IV:323; Sack 1932:396.

27(26) Eyes have short hairs. Middle back lacks bands of white coating. Middle tergites of abdomen are red, with a narrow black central longitudinal band. -- Separation of eyes same as the width of the triangle formed by the ocelli. Face /sic/ has light yellowish hairs. Antennae are small and reddish brown. Middle back is blackish blue, without bands, and has fairly long black and light yellow

hairs. Legs are black, but joints and proximal end of tibiae are reddish brown; and the hairs /of the legs/ are black; hind femora and tibiae are not thickened. Wings have a light brown spot on the distal end half. Abdomen is red and shiny, with a black triangular spot running from the base /i.e., forward end/ of the abdomen to the hind edge of the 3rd tergite; 2nd to 4th tergites have crescent shaped spots of a gray coating. 10 mm. USSR: Turkmeniya.

..... E. binominatus H.-B. 1923. Hervé-Bazin 1923, Bull. Soc. Entom. France:130; -- maculipennis Becker 1921:67; Sack 1932: 406.

28(25) Antennae black.

29(30) Eyes, middle back, scutellum, and sides of thorax have very short hairs. Scutellum is relatively long (its width is less than twice its length). -- Forehead is wide (at its narrowest point it is just slightly narrower than the 3rd segment of the antennae). Third segment of antennae is large. Middle back is blackish blue and shiny, with small dots. Legs are black, but the joints of the fore and middle legs, and the proximal third of the hind tibiae, are yellow; the hind femora are thickened slightly. Wings have a large brown spot located rearward of the wing ocellus, from the branching r_{2+3} + r_{4+5} to the bend in r_{4+5}. Abdomen is relatively narrow and long, black, but with 2nd and 3rd tergites red. 9 to 11 mm. USSR: deserts of Central Asia (Bet-Pak-Dala and Kara-kumy /sic/).

..... E. selevini Stack. 1949. Stackelberg 1949:429-430; -- deserticola Stack., Stackelberg 1949:431 (sec. typ., syn. nov.)

30(29) Eyes, middle back, scutellum, and sides of thorax have long, plumose,

Scutellum
light-colored hairs. A is shorter (its width is more than twice its length).

31(32) Larger: 10 to 11 mm. Hind femora are slightly thickened, with their greatest thickness in the proximal section (Fig. 9 - 1). The proximal boundary of the dark spot on the wing is located at the /vein/ vertex sc (Fig. 6). -- Abdomen red, with black basal and caudal areas, and sometimes with a black longitudinal band on the middle tergites. Width of forehead at narrowest point is approximately equal to the width of the 3rd segment of the antennae. Face, forehead, vertex, middle back, and pleurae /lit., "sides of thorax"/ are blackish blue, shiny, having small dots and long, plumose hairs. Legs are thin and black; the proximal part of the tibiae is yellow. USSR: Central Asia (Tashkent district, Gissarskiy mountain range).

..... E. tadzhikorum Stack. 1949. Stackelberg 1949:429.

Figs. 4 & 5

Fig. 4. Eumerus lunatus F. Male. Hind leg.
-- from Stackelberg.

Fig. 5. Eumerus urartorum Stack. Male. Hind leg.
-- from Stackelberg.

32(31) Smaller: 7 to 9 mm. Hind femora markedly thickened (with maximum width in the middle part)(Fig. 9 - 2). Proximal boundary of the dark spot of the wing is located at the level /sic/ of the branch-

ing r_{2+3} + r_{4+5} and the base of the discoidal /sic/ vein (Fig. 7). -- Abdomen largely red. Face, forehead, vertex, middle back, and sides of thorax /i.e., pleurae/ are blackish blue, shiny, with small dots and with long, white, plumose hairs. Legs are black; proximal part of tibiae is yellow. USSR: mountains of Central Asia (Gissarskiy range, western Pamir). Female is not known.

..... E. pamirorum Stack. 1949. Stackelberg 1949:427-429.

Fig. 6. Eumerus tadzhikorum Stack. Male. Original /drawing, here/.

Fig. 7. Eumerus pamirorum Stack. Male. Wing.
-- from Stackelberg.

33(22) Wings lacking large dark spot in distal half.

34(35) Forehead /i.e., front/ relatively very wide, being at its narrowest point wider than the 3rd segment of the antennae. Third segment of antennae elongated and egg-shaped, with a yellowish red color.

-- Forehead and face covered with grayish coating, and having white hairs; vertex and occiput a shiny blackish blue. Middle back black and shiny, with small dots, and having moderately long, yellowish brown, upright hairs in its forward half and black ones of similar description in its hind half. Legs black, /but/ the proximal part (one third to one half) of the forward and middle tibiae and tarsi are yellow. Abdomen is for the most part red; its forward and caudal parts are blackish blue, and shiny; sometimes in addition there is a longitudinal black band in the middle of the 2nd and 3rd tergites. 10 to 12 mm. USSR: mountains of Turkmeniya (Kopet-Dag) and Tadzhikistan (Gissarskiy range). Asia Minor, Syrian region of United Arab Republic, and Iran.

..... E. falsus Beck. 1921. -- rubriveullis /not sure of spelling -- illegible/ Becker 1921:67 (sec. typ.). -- latifrons Sack 1932:414 (syn.nov.). -- zaradnyi Stackelberg 1949: 431-433 (sec. typ., syn. nov.).

35(34) Forehead at its narrowest point is always narrower than 3rd segment of antennae.

36(37) Eyes naked. -- Forehead and face black, with a metallic luster, lacking a coating, and having white hairs. Eyes of the male are close but not contiguous. Antennae always completely black. Middle back slightly shiny, heavily dotted, having two longitudinal bands with gray dust, and having short light-colored hairs semi-lying-down. Legs black, /but/ the proximal part of the tibiae and the 3 proximal segments of the fore and middle tarsi are yellow. Second and third tergites of the abdomen are mostly red. 5 to 7 mm. USSR: European part (Leningrad oblast'). Most of Europe;

Northern Africa.

..... E. sabulonum Flln. 1817. Loew 1848:114; Lundbeck 1916:534; Sack 1932:415.

37(36) Eyes have dense, relatively long hairs.

38(39) Face /sic/ has long black hairs. Middle back has long, dense, upright, black hairs. -- Eyes have long, dense, white hairs, and are close together but not contiguous. Antennae are black. Middle back is a shiny blackish blue, with small dots. Legs black, /but/ joints and tarsi are yellowish brown on the ventral side /lit., "underneath"/. Abdomen is mostly yellowish red, and has a large triangular black spot which is wide at the forward part of the abdomen (1st tergite) and gradually narrows toward the caudad edge of the 3rd tergite. 10 mm. USSR: Central Asia (Turkmeniya, Uzbekistan).

..... E. nigrifacies Beck. 1921. Becker 1921:66; Sack 1932:407.

39(38) Face has white, grayish, yellowish, or light-brown hairs. Clothing of hairs on middle back is not black.

40(41) Only the 2nd tergite has a reddish yellow or brown triangular spot on the side. -- Face and forehead have snowy-white hairs. Eyes have fairly long, white hairs, and approach each other at a point. Antenna color varies from reddish yellow to dark brown; 3rd segment of antennae is of moderate size. Middle back has long, white, plumose, upright hairs, and lacks a band of a light-colored coating. Legs are black, with white hairs, /but/ joints are yellow. Wings are transparent; r_{4+5} over R_5 is clearly bent. Abdomen black with a metallic luster, and has wide, crescent shaped spots of a white coating on the 2nd to 4th tergites. 10 to 11 mm. USSR: sandy deserts of Central Asia and Kazakhstan. -- Turkmeniya

(Repetek), Barsuki. Larvae infest roots of giant /unknown word -- apparently means "broomrape"/ (Cistanche).

..... E. turkmenorum Par. 1927. Paramonov 1927, Tr. Fiz.-Mat. vidd. Ukr. AN, IV:324; Sack 1932:418.

41(40) At least the 2nd and 3rd tergites of the abdomen have reddish or yellowish spots on the sides, or the abdomen is mostly red.

42(43) Middle back and scutellum have very short hairs. Tarsi of all pairs of legs black.— Eyes of male approach each other at a point. Antennae black. Middle back has coarse and frequent dots, is slightly shiny, and has only vestiges of longitudinal bands of a white coating on its forward edge. Legs are black, /but/ joints are narrowly yellow. Wings are transparent; r_{4+5} above R_5 is distinctly bent. Abdomen red; forward part of abdomen, the more or less developed middle band on the 2nd and 3rd tergites, and the entire 4th tergite are all black; crescent shaped spots of a white coating are clearly developed on the 2nd to 4th tergites. 7 to 10 mm. USSR: middle and southern areas of the European part, north to Yaroslavsk oblast' and south to Crimea; Transcaucasus; Central Asia (around Tashkent); western Siberia. Central and southern Europe. Larvae infest roots of goat's beard (Tragopogon).

..... E. tricolor Mg. 1822. Sack 1932:417.

43(42) Middle back and scutellum have long, plumous hairs. Tarsi of fore and middle legs are largely yellow or yellow-brown.

44(45) Antennae black. Vertex has black hairs. Abdomen relatively narrow and long; body well-proportioned. Hypopygium has short black hairs. r_{4+5} above R_5 is distinctly but not strongly bent. --

Width of forehead at narrowest point is less than one half the width of the 3rd segment of the antennae; eyes have dense, long white hairs. Middle back and scutellum have soft dots, are bronze in color with a strong metallic luster, have long, upright, whitish hairs, and lack bands of a white coating. Legs are black, /but/ joints, the proximal part (one third to one half) of the tibiae, and the tarsi, of the fore and middle legs, are brownish yellow. Abdomen has large brownish red spots on the sides of the 2nd and 3rd tergites. 9 to 10 mm. USSR: Western Siberia, and northern Kazakhstan. Northern Europe.

..... E. sinuatus Lw. 1855. Loew 1855, Verh. Zool.-bot. Ges. Wien, V:692-693; Sack 1932:415.

45(44) Antennae reddish brown. Vertex has yellowish hairs. Abdomen is relatively short and wide; body is stocky. The 4th tergite, as a rule, is mostly a light yellowish brown. The hypopygium has long, light-colored hairs. r4+5 over R_5 is strongly bent (almost as in Eristalis). -- Eyes approach at one point, and have long yellowish white or light brownish hairs. Middle back has soft dots, is dark blue with a metallic luster, has long, upright, whitish hairs, and lacks light-colored longitudinal bands. Femora and tibiae (the latter with the exclusion of the proximal third) are black; the proximal third of the tibiae and tarsi, with the exception of the 1st segment of the hind tarsi, are reddish yellow. Abdomen is black, with large reddish yellow spots on the sides of the 2nd and 3rd tergites and a broad reddish yellow border on the caudad edge of the 4th tergite, or else abdomen is mostly reddish yellow with a wide black central longitudinal band on the 2nd and 3rd tergites. 10 to 12 mm. USSR: Central Asia (Uzbekistan -- in the okrug (region) of

Tashkent, the Gissarskiy mountains, and the Peter the First mountains). Belugistan /sic/ area of Iran.

..... E. coeruleus Beck. 1913. Becker 1913, Yezhegodn. Zoolog. muz. AN, XVII:602 (Lampetia); Paramonov 1937, Zbirn. prats' Zoolog. muz. Inst. zoolog. AN URSR, 20:71.

46 (1) Abdomen is a metallic green, blue, or black over its entire extent, and lacks red or yellowish spots on the sides of the 2nd and 3rd tergites; sometimes there may be merely a more or less wide yellow or brownish border on the caudad edge of the 4th tergite; or, rarely, there may be crescent shaped spots of the 2nd tergite which are quite translucent.

47(62) Eyes more or less widely spaced, or approach at only a single point.

48(51) Antennae black.

49(50) Antennae long: 2nd segment is approximately as long as the 3rd; 3rd segment of antennae is an elongated egg shape, with a nearly straight lower (/ventral/) edge. Eyes nearly naked. Ocelli located /at vertices of/ an equilateral triangle. -- Eyes approach at only a single point. Antennae black. Middle back black--bronze, with short light-yellow hairs, and with 2 narrow longitudinal gray-powdered bands. Legs black, /but/ proximal part of tibiae reddish brown; hind femora moderately thickened. Abdomen wide, /generally/ black in color, as a rule with its sides having a copper-colored iridescence, and abdomen further having 3 pairs of clearly developed, gray-powdered, crescent shaped spots on the 2nd to 4th tergites. 8 to 10 mm. Central Europe.

..... E. longicornis Lw. 1855. Loew 1855, Verh. Zool.-bot. Ges. Vien, V:695; Sack 1932:405.

50(49) Antennae moderately long; 2nd segment distinctly shorter than 3rd; 3rd segment of antennae wide, with sharpened vertex. Eyes have dense hair. Distance from forward ocellus to hind ones greater than the distance between hind ocelli. -- Eyes approach at a single point. Antennae black. Middle back black-green, with a gray coating, and with 4 darker /than with longicornis/ longitudinal bands. Legs black; hind femora strongly thickened; hind tibiae also thickened, at distal end; 1st segment of hind tarsi short and wide. Abdomen black, with bluish green tinge, and with 3 gray transverse bands on the 2nd to 4th tergites /presumably, one band on each tergite/; caudad edge of 3rd tergite and cephalad edge of 4th tergite have curved indentations, forming in conjunction an open space of oval shape. 8 to 9 mm. Canary Islands.

..... E. latitarsis Macq. 1838. Abreu 1924, Mem. Acad. Cienc. Art. Barcelona, XIX, 1:126-131; Sack 1932:404.

51(48) Antennae reddish yellow or reddish brown.

52(55) 4th tergite has a more or less wide yellow or yellowish brown border toward its caudad edge.

53(54) Face has fine (i.e., not thick) grayish white coating, is not shinier /than that of micans/, and has white hairs. -- Eyes approach in a single point, and have dense, long, light-colored hairs. Antennae are yellowish brown or reddish brown. Middle back has fine dots, is shiny, has dense, long, upright, dirty-white hairs, and in the forward half has 2 longitudinal striae /i.e., narrow bands/ with a gray powder. Legs are black, /but/ proximal third of tibiae is yellow; hind femora have a sloping rise underneath near the proximal end (Fig. 9 - 3). Abdomen slightly shiny, and has 3 pairs of

very wide, crescent shaped, white-powdery spots. 8 to 10 mm. USSR: Central Asia (southern Tadzhikistan).

..... E. mesasiaticus Stack. 1949. Stackelberg 1949:435-436.

54(53) Face is bluish black, shiny, lacks a coating, and has black hairs. -- Eyes approach in a single point, and have dense brown hairs. First segment of antennae is blackish, 2nd and 3rd segments are bright red, and 3rd segment has a pointed (distal) tip. Middle back and sternum are a steel blue color, shiny, with long, dense, white hairs. Legs black, /but/ joints and basal part of fore tibiae are reddish yellow. r_{4+5} over R_5 is strongly bent /i.e., curved/. Abdomen is a steel blue, shiny, with dense, long white hairs, and with 3 pairs of white-powdery crescent shaped spots on the 2nd to 4th tergites /i.e., one pair on each/. 8 mm. North Africa.

..... E. micans F. 1798. Sack 1932:406.

55(52) Fourth tergite lacks a light (yellow or brownish) border at its caudad edge; over the entire extent /of the 4th tergite/ there is a metallic luster, or in some parts there is a light-colored coating.

56(57) Second to 5th segments of hind tarsi are greatly widened, and have dense silvery white hairs. There are crescent shaped spots on the 2nd tergite which are reddish yellow in color and translucent. -- Eyes are distinctly separated, and have dense hairs. Antennae are a light reddish yellow; their 3rd segment is wide. Middle back is a dark bronzish green, shiny, with traces of light-colored bands on the cephalad edge, and with long, dense, yellowish brown hairs. Legs are black, /but/ the fore and middle tibiae (with the exception of a black ring beyond the center), the distal third of the fore and middle femora, tip of the hind ones,

and the basal half and tip of the hind tibiae, are reddish; further, the fore and middle tarsi are yellow; hind femora are moderately thickened; hind tarsi are longer than the hind tibiae; the 1st segment of the hind tarsi is thickened but not widened. Abdomen has yellowish white crescent shaped spots on the 3rd and 4th tergites; the spots on the 4th tergite are very narrow. 6 to 7 mm. Japan.

..... E. okinawaensis Shir. 1930. Shiraki 1930:98; Sack 1932:409.

57(56) Second to 5th segments of hind tarsi are not widened, and lack dense, silvery white hairs. The crescent shaped spots on the 2nd tergite are not reddish yellow and are not translucent.

58(59) Ocelli located /at vertices of/ an equilateral triangle. Hind femora are greatly thickened. Middle back, and indeed the entire body, is heavily dotted /lit., "sharpened"-- obviously an error/, has a dull, lusterless surface, and has short, light-yellow hairs. -- Face /sic/ has a white coating. Eyes approach in a single point, and have short hairs. Middle back is bluish black or greenish black, with 2 shiny longitudinal striae /i.e., narrow bands/. Legs are black, /but/ distal ends of femora, the basal half of the tibiae, and the underneath part /i.e., ventral part/ of the tarsi are all yellow; the bottom /(ventral)/ part of the hind femora in the distal third has a longitudinal ridge which bears a row of large, short spines. Abdomen is black, with pairs /lit., "3 pairs"/ of relatively wide crescent shaped spots on the 2nd to 4th tergites. 9 to 10 mm. Asia Minor.

..... E. rusticus Sack. 1932. Sack 1932:414.

59(58) Ocelli located /at vertices of/ an isosceles triangle (forward

ocellus is further from hindward ocelli than hindward ocelli are from each other). Hind femora are /only/ moderately thickened. Middle back has small, coarse dots, is shiny, and as a rule has longitudinal bands of a white coating.

60(61) Middle back has coarse dots, and 2 well developed longitudinal bands of a white coating. Face is moderately wide, is covered by a gray coating, and has long, dense white hairs. Eyes are separated at a distance, and have dense white hairs which are nonetheless moderately long. -- Antennae are not large; their 3rd segment is an elongated oval shape, straight at the distal end as if it had been cut off, and /said 3rd segment is/ entirely yellowish red. Middle back is shiny and has fairly long, upright white hairs. Legs black; /but/ the joints, the basal third of the tibiae, and the undersides /(ventral sides)/ of the tarsi are all yellow; the hind femora are not greatly thickened, and in their distal third there is a ridge extending from the forward-ventral surface /i.e., from underneath/, which ridge has 8 to 10 large, sharp spines. Abdomen is a shiny black, with coarse, frequent dots, and with pairs of relatively wide crescent shaped spots of a white coating on the 2nd to 4th tergites (Fig. 8). 9 to 11 mm. USSR: Transcaucasus (Nakhichevan ASSR).

..... E. richteri Stack. 1960. Stackelberg 1960:446.

61(60) Middle back has soft, delicate dots, and lacks longitudinal bands of a white coating. Face and forehead shiny black, lack a coating, and have long yellowish brown hairs. Eyes approach in a single point, and have dense, long, yellow-brown hairs. -- Antennae are reddish yellow. Middle back is a shiny black, with gray hairs. Legs are black /but/ the joints of the fore and middle legs are

reddish yellow, and the fore tarsi are reddish brown. Abdomen is black, with pairs of whitish gray crescent shaped spots on each of the 2nd to 4th tergites. 7 mm. North Africa.

..... E. interruptus Beck. 1907. Becker 1907, Zeitschr. Syst. Hymen. u. Dipter., VII, 3:247; Sack 1932:401.

62(47) Eyes are contiguous, or approach each other over a more or less large extent[1] /i.e., a long line/.

63(68) Hind trochanters have pronounced tooth-shaped or triangular-shaped processes (one per trochanter). Hind tibiae in their distal half on the ventral side have an oblique infolding (groove) /i.e., running at an oblique angle to the axis of the tibia/.

64(65) Hind femora have 2 to 3 large spines underneath (Fig. 9 - 4). Hind trochanters have a sharp, tooth-shaped process. 4th tergite lacks a yellow border at its caudad edge. -- Eyes have dense white hairs. Antennae are black. Mesothorax and abdomen are bronzish green, and mesothorax has two narrow, white-powdery longitudinal bands. Legs are black, /but/ the basal half of the fore and middle tibiae, the basal segments /(plural)/ of the cor-

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[1] In the males of E. ussuriensis Stack. and E. djakonovi Stack. (see below under Secs. 87 and 88) the eyes approach over a short enough /parallel/extent, but they absolutely are not contiguous; both these species from southern Primor'ye are distinguished by the color of the basal segments of the fore tarsi -- white with black spot underneath at the base; and by long black bristles on the exterior side of the basal segments of the fore tarsi. In niveitibia Beck. (Greece) the eyes are not properly contiguous; this species is distinguished by a cover of black hairs on the middle back and by dense, snowy-white hairs on the exterior /i.e. lateral/ surface of the hind tibiae.

responding tarsi, and the basal regions /i.e., basal end/ of the hind tibiae are all yellow; the hind tibiae are thickened toward the distal end and have an oblique /-running/ infolding (groove) on the ventral side; the 1st segment of the hind tarsi is distinctly longer than all the more distal segments taken together. Abdomen has 3 pairs of white-powdery crescent shaped spots; hypopygium has fairly long black hairs. 5 to 7 mm. USSR: Crimea and Transcaucasus (Azerbaidzhan). Southern Europe (Italy).

..... E. sulcitibius Rd. 1868. Rondani 1868, Atti Soc. Ital. Sci. Nat. Milano, XI:24; Sack 1932:417.

65(64) Hind femora lack large spines underneath near the middle /of their length/ (Fig. 9 - 5, 6). Hind trochanters have wide triangular process. Fourth sternite has a deep, almost rectangular indentation on its caudad edge.

66(67) Antennae black. Length of 2nd segment of hind tarsi exceeds its width (Fig. 9 - 5). Side sections of the indentation in the 4th sternite have long light-brown or yellowish hairs which are directed medially. -- Face has a dense /sic -- i.e., thick/white coating and white hairs. Eyes have sparse, relatively short hairs. Middle back is a bronzish green, with 2 well developed gray-powdery longitudinal bands, and has a side edge /i.e., border/ which is also gray-powdery. Legs dark bronzish, and shiny, /but/ basal half of tibiae and basal segments /(plural)/ of the fore and middle tarsi are yellow; there is a gently sloping recess on the interior side of the distal third of the hind tibiae. Wings transparent. Abdomen is long and cylindrical, mostly black, with basal end a bronze color, and has 3 pairs of obliquely oriented, slightly curved white-powdery spots; 4th tergite has a yellow border on its caudad edge; hypopygium has black hairs. 8 to 10 mm.

Fig. 8. Eumerus richteri Stack. Male.

-- from Stackelberg

USSR: mountains of Tadzhikistan (Gissarskiy mountains, /and/ western Pamir).

..... E. gussakovskii Stack. 1949. Stackelberg 1949:437-438.

67(66) Third segment of antennae reddish yellow. Width of 2nd segment of hind tarsi is almost twice its length (Fig. 9 - 6). Side sections of the indentation in the 4th sternite have moderately long brown hairs which are directed ventrally (i.e., downward). -- Face has a dense /i.e., thick/ white coating and white hairs. Eyes have sparse, relatively short hairs. Vertical triangle has a light-colored powder /lit., "pollen"/. Middle back is a dark bronze-green with 3 sharply expressed whitish-gray-powdered longitudinalbands which have a side boundary which is the same /i.e., whitish-gray-powdered/. Legs a shiny dark bronze, /but/ the basal half of the tibiae, the entire fore and middle tarsi, and the underside of the hind tarsi are yellow. Abdomen is long, mostly black, and has black hairs; on the sides near its basal end it is bronze in color; it has 3 pairs of obliquely oriented, white-powdery crescent shaped spots; its 4th tergite has a yellow border on its caudad edge; the hypopygium has upright brown hairs. 9 mm. USSR: Central Asia (mountains near Tashkent).

..... E. smirnovi Stack. 1949. Stackelberg 1949: 436-437.

68(63) Hind trochanters are simple, and either lack protuberances or have barely noticeable bulges. Hind tibiae lack an obliquely-running infolding (groove) on the ventral side of the distal half, and generally lack a recess there, but rarely one of the latter is found.

69(70) Hind tibiae have a sharp, spinelike, distally directed spur at their distal end on the ventral side (Fig. 10). Second and 3rd sternites have a tuft of long hairs. -- Eyes nearly naked. Anten-

nae yellowish brown. Middle back a bronze color. Coxae of fore and middle legs yellow. Hind tibiae have a deep groove on the ventral side in the distal half. Abdomen shiny black, with 3 pairs of white crescent shaped spots; length of the 4th tergite is twice that of the 3rd tergite. 7 to 9 mm. Southern Europe (Italy).

..... E. uncipes Rd. 1850. Rondani 1850, Ann. Soc. Entom. France, (2), VIII:123; Rondani 1857, Dipt. Ital., II:91; Sack 1932: 418.

Fig. 9. Eumerus. Hind leg of the male: 1 - E. tadzhikorum Stack.; 2 - E. pamirorum Stack.; 3 - E. mesasiaticus Stack.; 4 - E. sulcitibius Rd.; 5 - E. gussakovskii Stack.; 6 - E. smirnovi Stack. -- from Stackelberg

Fig. 10. Eumerus uncipes Rd., male. Hind leg. -- from Sack

Fig. 11. Eumerus emarginatus Lw., male. Hind leg. -- from Sack

70(69) Hind tibiae lack a sharp spur on their distal end. At least the 2nd sternite lacks a tuft of long white hairs.

71(76) Hind tibiae have a strongly expressed indentation or oblique groove on the ventral side in the distal half (Fig. 11). Hypopygium, as a rule, has black hairs.[1]

72(73) Antennae black. Legs black over their entire extent. -- Eyes have dense hairs. Body black-green, with a slight metallic luster. Middle back and sternum have very short light-yellow or whitish hairs, to which sometimes in the male black hairs are mixed in. Hind tibiae are thickened, and have a gently sloping indentation on their ventral side in the distal half (Fig. 11). Abdomen has 3 pairs of white-powdery crescent shaped spots; hypopygium has black hairs. 5 mm. Southern Europe.

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[1] If the hypopygium has white hairs, hind femora have a small tubercle at or near the base, /and/ hind tibiae /distally/ beyond the midpoint on their ventral side have a slight indentation, see E. reichardti Stack. (Sec. 80).

..... E. emarginatus Lw. 1848. Loew 1848:124; Sack 1932:400.

73(72) Antennae reddish yellow or reddish brown. Basal third of tibiae and part of tarsi are reddish yellow.

74(75) Middle back and abdomen have very short hairs which lie down; hypopygium has short black hairs. Fore and middle tarsi are black with the exception of the basal segment. Body is black or bronze colored, slightly shiny. -- Face and forehead have a snowy-white coating, and have white hairs. Middle back lacks longitudinal bands of a white coating, or has scarcely noticeable traces of same. Hind tibiae are thickened and have an oblique groove on the ventral side in the distal half. Abdomen has 3 pairs of narrow white-powdery crescent shaped spots; 4th sternite has long white hairs on the caudad half. 4.5 to 5.5 mm. Southern Europe, North Africa, and Asia Minor.

..... E. pusillus Lw. 1848. Loew 1848:133; Sack 1932:413.

75(74) Middle back and abdomen have fairly long, upright, gold-yellow colored hairs; hypopygium has fairly long white hairs. Fore and middle tarsi are yellow. Body is gold colored. (See Sec. 156.)

..... E. barbarus Coqueb. 1804.

76(71) Hind tibiae lack sharply expressed indentations or grooves on their ventral side in the distal half.

77(82) Hind femora have a fairly small, gently sloping tubercle on their underside at the basal end (Fig. 12).

78(79) The longitudinal bands of a light-colored coating on the middle back are well developed and extend beyond the transverse suture of the middle back. Abdomen is a bronze-green color; 4th tergite has well developed elongated spots of a gray coating. Close to E. strigatus Flln. (Sec. 119 infra), but differing from that species

in that the vertical triangle is narrower and less shiny, the 3rd segment of the antennae is narrower, the middle back and scutellum are less shiny, and the abdomen is shinier in E. tuberculatus, and in addition the 4th sternite of the abdomen, and the hypopygium, have a different structure in E. tuberculatus (Fig. 12). The gonocoxites are straight, with no hook (Fig. 12). 5 to 6 mm. USSR: European part, northward up to Khibin; Ukraine, Caucasus, northern Kazakhstan, Siberia (Western Siberia, Pribaykal, and Zabaykal), and the Shantarskiy islands. Europe, over a large portion. North China. Larvae infest onion bulbs, narcissus bulbs, and bulbs of other lilies; rhizomes of carrot, etc. Sometimes they do severe damage.

..... E. tuberculatus Rd. 1857. Collin 1920, Entom. Month. Mag., (3) VI:102-106; Sack 1932:418.

Fig. 12. Eumerus tuberculatus Rd. Male. 1 - Hind leg; 2 - 4th sternite; 3 - Hypopygium. -- from Collin

79(78) The longitudinal bands of a light-colored coating on the middle back are scarcely noticeable. Abdomen is black; 4th tergite lacks spots of a gray coating, or has only barely noticeable traces of

them.

80(81) Eyes have long and fairly dense white hairs. Forehead is a little longer from top to bottom than the line of contiguity of the eyes; the vertical triangle is wider /than in caucasicus/; the ocelli on the vertex are positioned approximately at the vertices of an equilateral triangle; the distance from the forward ocellus to the hindward ocelli is barely greater than the distance between the hindward ocelli (Fig. 13 - 1). -- Body is a dark bronze--green, nearly black. Forehead and face are covered with a grayish white coating, and have white hairs. Middle back is shiny; in its forward half it has slightly noticeable narrow longitudinal bands of a white coating. Legs are black, with a bronze iridescence and a metallic luster; the tip of the femora, the basal third of the tibiae, and the underside of the tarsi are all reddish yellow. Abdomen has pairs of narrow spots of a white coating on each of the 2nd and 3rd tergites; the 4th sternite has a triangular indentation on its caudad edge; the hypopygium has white hairs. 5 mm. USSR: Eastern Pamir (Sary-Kol mountains).

..... E. reichardti Stack. 1952. Stackelberg 1952:383.

Fig. 13. Eumerus reichardti Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Hind leg.

-- from Stackelberg

81(80) Eyes have short, sparse white hairs. Line of contiguity of the eyes is clearly longer than the height of the forehead; vertical triangle is narrower /than in reichardti/ (Fig. 14 - 1); ocelli on the vertex are located at the vertices of an isosceles triangle (the distance from the forward ocellus to the hindward ocelli clearly exceeds the distance between the hindward ocelli). -- Body is a dark bronze-green, nearly black. Forehead and face have a sparse /sic -- i.e., insubstantial/ gray coat with white hairs; Forehead is insignificant in extent, and is low. Middle back is shiny; the cephalad half has slightly noticeable, narrow, longitudinal bands of a white coat. Abdomen has pairs of narrow spots of a white coating on the 2nd and 3rd tergites; 4th sternite has a deep, narrow indentation on the caudad edge; hypopygium has white hairs. 4.5 mm. USSR: Caucasus: Gruziya (Gudauty).

..... E. caucasicus Stack. 1952. Stackelberg 1952:385.

Fig. 14. Eumerus caucasicus Stack. Male. 1 - Head, top aspect; 2 - Antenna.

-- from Stackelberg

82(77) Hind femora lack a tubercle underneath at the basal end.

83(84) Middle back has long black hairs. Hind tibiae have dense, snow-white hairs on their dorsal surface. Hind femora and tibiae

scarcely show thickening. -- Eyes have light-yellow hairs; eyes are close but not contiguous. Vertical and frontal triangles and face are very narrow, of a shiny black color, and have black hairs. Antennae are black and of insignificant size. Middle back is a shiny bluish black, lacks light-colored longitudinal bands, and has long black hairs. Legs are black. Abdomen is a shiny black, with 3 pairs of gray crescent shaped spots. 10 mm. Greece. ..... E. niveitibia Beck. 1921. Becker 1921:69; Sack 1932: 407.

84(83) Middle back has light-colored hairs; /but/ if some are dark then the hind femora are strongly thickened. Hind tibiae lack dense, snow-white hairs on their dorsal surface.

85(120) Antennae are black or black-brown.

86(89) The three segments of the fore tarsi nearest the base are whitish, and have 1 to 2 long, stout, black bristles on the sides at the distal end, with the length of these bristles exceeding the girth of the tarsus; the 2nd and 3rd segments of these tarsi have sharply expressed black spots (one per segment) on the underside at or near the basal end (Fig. 15 - 3).

87(88) Eyes have dense white hairs which are fairly long. Vertical triangle is wider /than in djakonovi/ (Fig. 15 - 1); ocelli are positioned at the vertices of an equilateral triangle; the vertex of the head has long yellowish white hairs; the face has a whitish gray coating. -- Body is a dark olive green, finely dotted, slightly shiny. Middle back has moderately long, light brownish yellow upright hairs, and scarcely noticeable longitudinal bands of a light-colored coating. Legs are black, /but/ basal half of the fore and middle tibiae is light yellow; the 3 proximal seg-

ments of the fore and middle tarsi are whitish, with long bristles at the distal end /of each/ along the external edge /i.e., the exterior semicircular perimeter of the distal edge/, and with a black spot underneath, at or near the basal end /of each segment named/; hind femora are strongly thickened. Abdomen is relatively wide, with 3 pairs of obliquely oriented spots of a grayish coating; 4th sternite has a gently curved indentation; hypopygium (Fig. 15 - 4) has light-yellow hairs. 8 to 11 mm. USSR: Priamur'ye and southern Primor'ye.

..... E. ussuriensis Stack. 1952. Stackelberg 1952:376-378.

Fig. 15. Eumerus ussuriensis Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Fore tarsus, bottom aspect; 4 - Hypopygium. -- from Stackelberg

88(87) Eyes have short, sparse, light-colored hairs. Vertical triangle narrower /than in ussuriensis/ (Fig. 16 - 1); ocelli located at the vertices of an isosceles triangle; distance of forward ocellus from hindward ocelli is greater than the distance between the hindward ocelli; vertex of head has long brown hairs; face has a metallic luster and lacks a coating. Close to ussuriensis. Abdomen longer than that of ussuriensis, and is practically black; caudad edge of the 4th tergite is often reddish or yellowish. 8 to 11 mm. USSR: Priamur'ye and southern

Primor'ye. Korea.

..... E. djakonovi Stack. 1952. Stackelberg 1952:378-379.

89(86) Fore tarsi are black or black-blue up to the basal end; 1st to 3rd segments of fore tarsi lack long black bristles at the distal end; if the basal segments of the fore tarsi are lighter in color (yellow-brown) then sharply expressed black spots on the underside /of these segments/ are always wanting.

90(91) Forehead and face have long black or dark-brown hairs and a metallic luster, and lack a coating. -- Eyes have long, dense, dirty-white hairs. Vertical triangle is very narrow and high /i.e., long/, with a dark blue color; ocelli are located at the vertices of an isosceles triangle: forward ocellus is farther from the hindward ocelli than the hindward ocelli are from each other. Forehead and face are black-blue, and shiny, and lack a coating. Antennae are black. Middle back is dark blue and shiny, with small dots, lacks bands of a light-colored coating, and has long, dense, upright white hairs. Legs are black; joints are yellowish. Abdomen is relatively short and wide, of a black-blue color, slightly shiny, and has 3 pairs of wide crescent shaped spots of a white coating. 7 to 8 mm. USSR: Tadzhikistan (foothills of the Gissarskiy mountains).

..... E. hissaricus Stack. 1949. Stackelberg 1949:438-439.

91(90) Face and forehead have light-colored hairs, and as a rule are covered by a white or gray coating.

92(95) Hind femora are strongly thickened and bent; underneath in their distal third there is a protruding scaly ridge which bears a row of spines. The 1st segment of the hind tarsi lacks clumps of black hairs on the top /i.e., dorsal/ side.

93(94) Caudad edge of the 4th tergite is brownish-yellow. Eyes are nearly naked. -- Antennae black. Body black, with a bluish iridescence. Middle back has short hairs which lie down, and has 3 longitudinal bands of a white coating. Legs black; /but/ joints and the basal half of the tibiae are reddish yellow; abdomen has 3 pairs of crescent shaped spots of a white coating; 4th sternite has a narrow, deep /i.e., long/ gap in the middle of its caudad edge. 10 to 11 mm. Southern Europe; North Africa; Asia Minor.

..... E. nudus Lw. 1848. Loew 1848:117; Sack 1932:407.

94(93) Fourth tergite is black over its entire extent. Eyes have fairly long hairs. Face and forehead have a white coating. Antennae are black. Body is black, with a bluish iridescence. Middle back has small dots, is shiny, has 3 longitudinal bands of a white coating, and has moderately long, upright white hairs. Legs are black, /but/ the fore and middle coxae and the basal half or basal third of all tibiae are reddish yellow; the hind femora are strongly thickened; the hind tarsi are stout; the 2nd to 4th segments of the hind tarsi are short (their width is much greater than their length, for each one). Abdomen is long, with 3 pairs of crescent shaped spots of a white coating; the 4th tergite has a small indentation in the middle of its caudad edge; the 4th sternite is of insignificant size, and /sic/ is narrow; gonocoxites are very large, free, and triangular; hypopygium has black hairs. 10 to 11 mm. Southern Europe.

..... E. olivaceus Lw. 1848. Loew 1848:116; Sack 1932:408.

95(92) Hind femora vary in thickness, but lack a scaly ridge underneath in their distal third; if such a ridge is present in /only/ a rudimentary state, then the 1st segment of the hind tarsi has clumps

of long black hairs on its top /(dorsal)/ side.

96(99) At least the 1st segment of the hind tarsi is greatly compressed from the sides, and has clumps of long black hairs on its top /(dorsal)/ side or else has long black cilia there (Fig. 17).

Figs 16 & 17

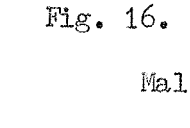

Fig. 16. Eumerus djakonovi Stack. Male. 1 - Head, top aspect; 2 - Antenna. -- from Stackelberg

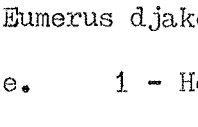

Fig. 17. Eumerus obliquus F. Male. Hind leg. -- from Sack

97(98) Abdomen has a dull appearance, and has a pair of white crescent shaped spots on each of the 2nd and 3rd tergites; the 4th tergite has a substantial /lit., "dense" in the sense of closely packed/ light-colored coating over its entire extent; hind tarsi have long black cilia on their top /(dorsal)/ side, which cilia are developed /sic/ only in the proximal part of the tarsus. -- Eyes have short light-colored hairs. Antennae black; sometimes the 3rd segment of the antennae is reddish brown. Face and forehead have a silvery white coating and white hairs. Middle back is mostly covered with a yellowish gray coating, and has shiny narrow longitudinal bands. Legs are black, /but/ the joints of the fore and middle legs are broadly yellow /i.e., not a single shade/; and the fore and hind tarsi are yellow on the underside. 8 to 10 mm.

Northeast Africa.

..... E. vestitus Bezzi 1912. Bezzi 1912, Ann. Mus. Genova, 45:442; Bezzi 1915:111; Efflatoun 1922:112-114.

98 (97) Abdomen shinier, with 3 pairs of crescent shaped spots, one on each of the 2nd to 4th tergites; 4th tergite is shiny over most of its surface, and lacks a coating; hind tarsi have long black cilia on the top /(dorsal)/ side over the entire extent of the tarsus. -- Eyes have short but dense hairs. Antennae are black; the 3rd segment is egg-shaped. Face and forehead have a yellowish-white (yellowish white) coating and hairs the same color. Middle back is black with a slight metallic luster and with fairly short, upright, light-colored hairs; light-colored longitudinal bands are lacking in the middle back or are scarcely noticeable. Legs are black; /but/ basal end of tibiae is reddish brown; tarsi are brown; hind femora are strongly thickened, and in their distal part on the underside they have a protruding ridge bearing an external row of spines; hind tarsi are compressed from the sides, have short 2nd to 5th segments, and have long black cilia on the top /(dorsal)/ side (Fig. 17). Abdomen is black, with 3 pairs of white crescent shaped spots; hypopygium has brown or black hairs. 6.5-7.5 mm. Southern Europe, and Africa.

..... E. obliquus F. 1805. Bezzi 1915:111 and 116; Sack 1932:408; -- cilitarsis Loew, 1848:120.

99 (96) Hind tarsi, in particular their 1st segment, lack clumps of long black hairs and lack long black cilia, on the top /(dorsal)/ side.

100(101) Hind tibiae are thickened in their distal half, and on their ventral side ahead of the distal end have a clump of long black and

long reddish brown hairs. -- Head is shiny black. Eyes have sparse hairs. Face has silvery white hairs. Middle back is greenish black or gold-green, with coarse dots, and has 3 longitudinal light-colored bands in its forward part; 2 side bands which are wider /than the center one/, and a narrow center band. Legs are black; /but/ fore and middle coxae, joints, basal end /sic/ of the tibiae, and basal segment of the fore tarsi are all reddish brown; hind femora are strongly thickened, as are the hind tibiae ahead of the distal third. Abdomen is black with metallic-green sides, and with 3 pairs of gray-powdery crescent shaped spots. Central Europe (Hungary).

..... E. hungaricus Szil. 1940. Szilady 1940, Ann. Mus. Nat. Hung., XXXIII:69.

101(100) Hind tibiae lack a clump of long dark hairs in the distal third of the ventral surface.

102(103) Legs are black, but the tibiae of the fore and middle legs are narrowly yellow /i.e. without shade variations over their extent/ Hypopygium black, with black hairs. -- Eyes have short hairs. Forehead silvery white. Antennae relatively large; 3rd segment has a rounded forward edge. Middle back has 4 yellowish white longitudinal bands. Hind femora and hind tibiae are strongly thickened. Abdomen is a copper-red in its cephalad part, and black in its caudad part, with 3 pairs of white-powdery crescent shaped spots. 6 to 8 mm. Madeira and the Canary Islands.

..... E. purpureus Macq. Abreu 1924, Mem. Acad. Cienc. Art. Barcelona, XIX, 1:131-133; Sack 1932:412.

103(102) Basal third of fore and middle tibiae is less yellow /than in E. purpureus/. Hypopygium has white hairs.

104(107) The longitudinal bands of a light-colored coating on the mesothorax are developed over the entire extent of the latter, from its cephalad edge to the scutellum; these bands have more or less the same unvarying width over their entire extent; /however,/ as a rule the bands merge ahead of the scutellum; the side edge of the mesothorax has a wide border comprised of a gray coating.

105(106) Caudad edge of the 4th tergite, as a rule, is yellow. Vertical triangle has small dots.

At least the middle tarsi are yellow over a significant area. Larger: 9 to 10 mm. -- Eyes have dense but relatively short, white hairs. Front and face have a white coating, with dense, snow-white hairs. Vertical triangle is relatively narrow and for the most part covered by a gray coating; ocelli are positioned at the vertices of an equilateral triangle. Mesothorax is a metallic green, with 5 longitudinal bands of a light gray coating; the 3 middle bands merge ahead of the scutellum (Fig. 18 - 3) /sic -- merging not shown/. Legs are black-green, with a metallic luster; the basal third of the fore and middle tibiae, and the middle tarsi, are all mostly yellow; the hind femora are strongly thickened. Abdomen has 3 pairs of obliquely oriented crescent shaped spots of a gray coating; the spots on the 3rd and 4th tergites reach to the side edge of the tergite; the hypopygium has upright white hairs; the 4th sternite has a triangular indentation on its caudad edge, within which two dense aggregations of black bristles are located (Fig. 18 - 4); gonocoxites have axe-shaped broad configurations in their tip parts (Fig. 18 - 5). USSR: mountains of Tadzhikistan, at altitudes of 1000 to 2500 m (Gissarskiy range, and western Pamir).

..... E. Rushanicus Stack 1952. Stackelberg 1952:380-382.

Fig. 18. Eumerus rushanicus Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Mesothorax, showing pattern of bands of the coating; 4 - 4th sternite; 5 - Hypopygium.

-- from Stackelberg

106(105) Fourth tergite is entirely metallic-green. Vertical triangle has coarse /i.e., relatively large/ dots. Tarsi are black. Smaller /than rushanicus/: 5 mm.

-- Eyes have short, barely noticeable hairs. Face and front have dense white hairs, and in addition the face has a white coating; vertical triangle has a barely noticeable coating; ocelli are located at the vertices of an isosceles triangle. Mesothorax is a black-green color, with a violet tinge in the middle part; the longitudinal bands of a light-colored coating on the mesothorax are not sharply expressed, and sometimes they are noticeable only in the cephalad part of the mesothorax; the hairs of the mesothorax and scutellum are long and white. Legs are black, with reddish brown joints. Abdomen has 3 pairs of strongly expressed crescent shaped spots of a white coating. Syrian region of the United Arab Republic.

..... E. punctifrons Lw. 1857. Loew 1857, Verh. Zool.-bot. Ges. Wien, VII:85; Sack 1932:412.

Fig. 19. Eumerus kondarensis Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - 4th sternite; 4 - Gonocoxite. -- from Stackelberg

107(104) The longitudinal bands of a light-colored coating on the mesothorax clearly taper off toward the caudad end of it, and do not survive to the scutellum; the gray powdery area forward of the scutellum is not developed; the side bands of light-colored coating on the mesothorax are weakly developed or completely wanting (this serves to exclude E. kondarensis Stack.).

108(109) The shoulder tubercles and the side edge of the mesothorax have a dense /i.e., substantial/ whitish gray coating. Mesothorax has a median longitudinal band of a light-colored coating. Caudad edge of 4th tergite has a yellow border. -- Body is dark metallic green. Eyes have fairly long, dense white hairs. Front and face have a white coating, with long, dense snow-white hairs; vertical triangle has a metallic luster; ocelli are located at the vertices of an isosceles triangle (Fig. 19 - 1). The hairs of the mesothorax and scutellum are light-colored, brownish, of moderate length, and upright.

Legs are black; /but/ the basal part (one third to one half) of the tibiae, and part of the tarsi, are brownish yellow. Abdomen has 3 pairs of obliquely oriented crescent shaped spots of a white coating; gonocoxites are short, of an irregular trapezoidal shape, with rounded corners (Fig. 19 - 4). 7 to 8 mm. USSR: Kazakhstan (Alma-Ata) and Tadzhikistan (Gissarskiy mountain range).

..... E. kondarensis Stack. 1952. Stackelberg 1952:382-383.

109(108) The shoulder tubercles and the side edge of the mesothorax are shiny and lack a coating. The median longitudinal band of a light-colored coating on the mesothorax is not manifest /i.e., not pronounced/, as a rule. The caudad edge of the 4th sternite has a deep, strongly expressed indentation. Fourth tergite is metallic-green or bronze in color over its entire extent up to its caudad edge.

110(111) Second to 4th segments of hind tarsi are short; the width of the 2nd segment is approximately twice its length, and the 3rd and 4th segments are respectively three times as wide as they are long (Fig. 20 - 3) /sic -- not evident from Figure/. -- Body is a dark bronze color with a violet iridescence. Eyes are nearly naked. Front and face have a white coating, with long white hairs. Vertical triangle is relatively narrow, shiny black in color, with black hairs; ocelli are located at the vertices of an isosceles triangle; the distance between the forward ocellus and the hindward ocelli is greater than the separation of the hindward ocelli (Fig. 20 - 1). Mesothorax is a dark bronze color, slightly shiny, with 2 longitudinal bands of a light-colored coating which do not extend to the scutellum; a large part of the mesothorax is covered with short black hairs. Legs are black, /but/ the basal third of

the tibiae is yellow. The spots of a light-colored coating on the abdomen are oriented obliquely, with those on the 2nd tergite being narrow, those on the 3rd tergite moderately wide, and those on the 4th tergite wide; 4th sternite has a deep rectangular indentation /on its edge/; hypopygium has fairly long black hairs. 8 to 10 mm. USSR: southern Primor'ye. Southeastern China. ..... E. chrysopygus Sack 1941.[1] Sack 1941, Arb. morphol. taxon. Entom., 8, 3:190; Stackelberg 1952:379-380.

111(110) Second to 4th segments of hind tarsi are not shortened; length of the 2nd segment exceeds its width at least.

112(113) First segment of hind tarsi is broadened and relatively short, shorter than the combined length of the second and 3rd segments of the respective tarsi /i.e., 2nd + 3rd in one tarsus/. Body is a gold-green or bronze-green, frequently found also with a violet iridescence. Eyes have fairly long, dense white hairs. Front and face are covered with a white coating, and long, dense white hairs; vertical triangle is relatively wide, bronze in color, shiny, and mostly covered with black hairs; ocelli are located at the vertices of an isosceles triangle (Fig. 21 - 1). Mesothorax has 2 longitudinal bands of a white coating, with light-yellowish-brown, upright hairs. Legs are a bronze-green, and shiny; /but/ the distal end of the femora, and the basal one third or one half of the tibiae and tarsi, with the exclusion of the distal/most/ segments /in the tarsi/, are a light-brown-yellow. The light-colored spots on the abdomen have the form of obliquely oriented, narrow bands

[1] If bands of a light-colored coating on the mesothorax are not developed /sic/, the length of the 2nd segment of the hind tarsi equals the width of same, and the body is smaller (6 mm), see E. rezvoi Stack. (Sec. 149).

which do not extend to the side edges of the corresponding tergite; distal end of abdomen and hypopygium have gold-colored hairs; 4th sternite has rough wrinkles, and has a deep, sharp indentation in the middle of its caudad edge; gonocoxites are bifurcated at the distal end (Fig. 21 - 3). 7 to 8 mm. USSR: mountains of Central Asia (Gissarskiy and Darvazskiy ranges).

..... E. bactrianus Stack. 1952. Stackelberg 1952:388-390.

113(112) First segment of hind tarsi is longer /than in bactrianus/; with a length equal to or greater than that of the 3 subsequent segments combined.

114(117) Eyes have dense, moderately long hairs. Fourth tergite either lacks crescent shaped spots of a light-colored coating or has only barely noticeable traces of them; further, this tergite is elongated (approximately one and one half times the length of the 3rd tergite) and narrows distinctly in the hindward direction.

115(116) Body a bronze-green color. Mesothorax has a fairly wide, light-colored /evidently transverse/ longitudinal medial band which, like the middle bands, is developed approximately to the level of /i.e., as far caudally/ as the base of the wings. The dotting of the mesothorax comprises small, densely spaced dots; mesothorax is slightly shiny. Second and 3rd tergites are black in the middle /sic/ part. -- i.e., between the cephalad and caudad edge -- Front and face are narrow, covered with a grayish white coating, and have long white hairs; vertical triangle is narrow and shiny; ocelli are located at the vertices of an equilateral triangle. Legs are a dark bronze color and shiny, /but/ distal end of femora and the basal third of the tibiae are reddish yellow. Abdomen is a dark-bronzish-green; 2nd and 3rd tergites have crescent shaped spots of a gray coating; 4th sternite has a shallow, curved indentation on

its caudad edge (Fig. 22 - 1); gonocoxites are simple and more or less of uniform width over their entire extent (Fig. 22); hypopygium has light-yellow hairs. 7 mm. USSR:Eastern Siberia (Pribaykal'ye).

..... E. sibiricus Stack. 1952. Stackelberg 1952:391-392.

Fig. 20. Eumerus chrysopygus Sack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Hind leg.
-- from Stackelberg

Fig. 21. Eumerus bactrianus Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Hypopygium.
-- from Stackelberg

116(115) Body a light metallic green. Mesothorax has a very narrow, light-colored medial longitudinal band, or nome at all. The dotting of

the mesothorax comprises larger and sparser dots /than in bactriana/; mesothorax is shiny. Entire abdomen is a light metallic green. -- Front and face are moderately wide, covered with a whitish gray coating, and have white hairs; vertical triangle is wide, with a metallic luster; ocelli are located at the vertices of an isosceles triangle. Mesothorax has 2 longitudinal bands of a gray coating which do not extend to the scutellum. Legs are dark green, with a metallic luster; the distal end of the femora, the basal third of the tibiae, and the underside of the tarsi are all yellow. Abdomen has narrow, crescent shaped, obliquely oriented spots on the 2nd and 3rd tergites; hypopygium has light-colored hairs. 6 to 7 mm. USSR: southern European part (lower Pobolzh'ye and southern Priural'ye). Southern Europe (Spain).

..... E. pauper Back. 1921. Becker 1921:71; Gil Collado 1930:306-308; Sack 1932:411.

Fig. 22. Eumerus sibiricus Stack. Male. 1- Fourth sternite; 2 - Hypopygium.
-- from Stackelberg

117(114) Eyes have sparse hairs. Fourth tergite has clearly developed, white-powdery, crescent shaped spots; this tergite is not elongated (it is scarcely longer than the 3rd tergite), and it /only/ slightly narrows toward its caudal end.

118(119) Vertical triangle is narrow (Fig. 23 - 1). Ocelli on the vertex of the head are located at the vertices of an isosceles triangle. Fourth sternite has a small paddle-shaped process extending from each side of an indentation on its caudad edge (Fig. 23 - 3); gonocoxite lacks a hook on its distal end (Fig. 23 - 4). -- Body a metallic-green or bronze color. Eyes have short, sparse hairs. Front has a yellowish white coating; face has a dirty-white coating and long white hairs. Vertical triangle is a dark-metallic-green or /a/ bronze color. Very close to E. strigatus Flln. (infra), but antennae are somewhat narrower. 7 to 8 mm. Southern USSR: Transcaucasus; Kazakhstan north to Atbasar; Tadzhikistan and Uzbekistan (foothills); and Kirgiziya. China (the Gashun Gobi). Larvae (in the Transcaucasus) damage rhizomes of members of the carrot family. ..... E. sogdianus Stack. 1952. Stackelberg 1952:390-391. (Footnote: Evidently E. vitripennis Coe, which I have not had personal access to, is close to this species.)

119(118) Vertical triangle is wide. Ocelli on the vertex of the head are located at the vertices of an equilateral or nearly equilateral triangle. Fourth sternite has a wide triangular indentation on its caudad edge, lacking any growths from the sides of the indentation; gonocoxite has a hook at its distal end (Fig. 24). Body is metallic-green or bronze in color. Eyes have short, sparse hairs. Front and face have a white coating and white hairs. Vertical triangle is a metallic green. Mesothorax has 2 longitudinal bands of a white coating which do not extend to the scutellum, and has moderately long upright hairs, which are whitish gray or light-yellowish-brown. Legs are black-green, and shiny; /but/ the basal third of the tibiae is yellow. Abdomen has 3 pairs of crescent

shaped spots of a white coating. 6 to 8 mm. USSR: European part other than the far north, and south to the southern Ukraine and Rostovskaya oblast'; northern Kazakhstan; and western Siberia (Pribaykal'ye). Most of Europe. North America. Larvae develop in bulbs of garden onions and rhizomes of carrots.

..... E. strigatus Flln. 1817. Lundbeck 1916:537; Collin 1920, Entom. Month. Mag., (3) VI:102-106; Sack 1932:416-417.

Fig. 23. Eumerus sogdianus Stack. Male.
1 - Head, top aspect; 2 - Antenna;
3 - Fourth sternite; 4 - Gonocoxite.
-- from Stackelberg

Fig. 24. Eumerus strigatus Flln. Male.
1 - Fourth sternite;
2 - Hypopygium.
-- from Stackelberg

120 (85) Antennae are yellow, reddish yellow, or reddish brown.

121(128) At least hind tarsi, and frequently also the hind tibiae, are widened, and have dense snow-white hairs on the front /sic -- evidently means ventral side of these tarsi and tibiae/.

122(123) Light crescent shaped spots are developed only on the 3rd tergite of the abdomen. Body is a dark metallic, nearly black color. Ver-

tical triangle is long and narrow, dark-blue in color; ocelli are located at the vertices of an equilateral triangle, and are shifted substantially forward. Eyes have short, sparse hairs. Antennae are a light-reddish-brown; their 3rd segment is relatively narrow. Mesothorax is a metallic green in its middle part, with 2 clearly developed longitudinal white bands (striae), and is greenish black on its sides. The legs, in particular the hind femora, are slightly thickened; the legs are mostly black, with tibiae yellow at the basal end; hind tibiae and tarsi in the male are strongly widened, and on the front /i.e. the ventral side/ they have dense, snow-white hairs; tarsi of the fore and middle legs are brownish yellow. Abdomen is black-blue; in the male it has a single pair of narrow crescent shaped spots /,/ on the 3rd tergite; hypopygium has short black hairs; gonocerci are inflated like bladders, and are yellow. 6 mm. USSR: Near Caucasus /lit., "Predkavkaz'ye"/ (Cagra). Southern Europe and Asia Minor. This species is rare.

..... E. argyropus Lw. 1848. Loew 8484:135; Sack 1932:398.

123(122) Light-colored crescent shaped spots are developed on the 2nd to 4th tergites.

124(125) Hind tibiae are strongly widened, and over their entire extent they have snow-white hairs. -- Front has a light-yellow coating and long light-yellow hairs. Face is a metallic green, lacks a coating, and has brownish yellow hairs. Eyes have dense, long hairs. Vertical triangle is narrow and long; ocelli are located at the vertices of an equilateral triangle, and are shifted strongly forward. Antennae are light reddish yellow in color. Thorax is olive-green. Mesothorax lacks light-colored longitudinal bands,

and has dense, long white-yellow hairs. Femora are black; fore and middle tibiae are a light yellowish brown; fore and middle tarsi are white with the exception of their basal ends; hind tibiae and tarsi are widened, and have dense, snow-white hairs. Abdomen is black, with 3 pairs of narrow white crescent shaped spots; hypopygium is black, with black hairs; gonocerci are relatively large, and yellow. 7 mm. USSR: southern Primor'ye.

..... E. elegantissimus Stack. 1930. Stackelberg 1930, Konowia, 9:233; Sack 1932:400.

125(124) Hind tibiae are slightly widened, solely at the distal end, and have white hairs in a non-dense growth and only in their distal part (distal third or one-fourth).

126(127) Second tergite has light-colored crescent shaped spots of moderate size. Second segment of the hind tarsi is strongly widened (it is scarcely longer than its width). -- Face and front are narrow, with a white coating and long white hairs. Eyes have short, sparse hairs. Vertical triangle is narrow and long; ocelli are located at the vertices of an isosceles triangle and are shifted strongly forward. Antennae are reddish yellow. Thorax and abdomen are black, with a metallic luster and steel-blue iridescence. Mesothorax lacks light-colored longitudinal bands. Legs are black, /but/ fore and middle tibiae and tarsi are brownish yellow; hind tarsi are strongly widened, of a white color, with dense snow-white hairs. Abdomen has 3 pairs of white crescent shaped spots, with the first /(cephalad)/ pair being wider and more translucent than the others; hypopygium is black, with black hairs; gonocerci are inflated /also means "swollen"/ and of a yellow color. 7 mm. USSR: European part (Estonia, and Leningradskaya, Nermskaya, and

Khar'kovskaya oblasti /intermediate sized regions/), and Priamur'ye. Large part of Europe. This species is rare.

..... E. flavitarsis Zett. 1843. Zetterstedt 1843, Dipt. Scand., 11:867; Sack 1932:400. -- silesiacus Becker 1921 (sec. typ., syn. nov.).

(Footnote: E. ehimensis Shir. et Edash. 1953 is close to this species and possibly identical to it. (Trans. Shikoku Entom. Soc., 111, 5-6:112-114).)

127(126) The light-colored crescent shaped spots on the 2nd tergite are very wide, taking up around half of the length of the tergite /in their width/. Second segment of hind tarsi is moderately widened (length one and one-half times width). -- Close to flavitarsis. Vertical triangle is very narrow (its height is approximately 3 times its width measured behind the ocelli), and is black in color, with a bluish tinge. Mesothorax is black with a blue tinge, has small dots, and is shiny and lacks light-colored longitudinal bands; scutellum is relatively long; mesothorax and scutellum have moderately long, upright, whitish-yellow or brownish hairs. Abdomen is relatively long and narrow; the spots on the 2nd tergite are large, triangular or quadrangular, yellowish white in color, and translucent; the spots of the 3rd tergite are narrow; those of the 4th tergite are narrow and ill-defined, comprising a gray powder. 6 to 8 mm. USSR: Sakhalin island. Japan and Korea.

..... E. japonicus Mats. 1915. Shiraki 1930:96; Sack 1932: 402.

128(121) Hind tarsi and hind tibiae are not widened, and lack dense snow-white hairs.

129(130) Second tergite has 2 oval, yellow, translucent spots which lack a

coating. Mesothorax lacks longitudinal bands of a light-colored coating. -- Antennae are large and yellow. Front and face have a white coating; vertical triangle of the head is a bronze-green. Mesothorax is a black-bronze-green. Legs are black, /but/ with joints and tarsi yellow. Abdomen is black, with 2 oval spots on the 2nd tergite, and pairs of crescent shaped spots of a white coating on each of the 3rd and 4th tergites. 7 mm. China.

..... E. macrocerus Wd. 1830. Sack 1932:407.

130(129) Second tergite has crescent shaped spots which are cometimes /sic -- i.e., "the covering of which is"/ slightly translucent, and which are covered with a white coating. Mesothorax, as a rule, has longitudinal bands of a white coating.

131(134) The line of contiguity of the eyes is 1.5 to 3 times as long as the height of the frontal triangle.

132(133) Eyes have dense, light-brown hairs. The line of contiguity of the eyes is about 3 times as long as the height of the frontal triangle. Antennae are reddish brown. The crescent shaped spots on the abdomen are not translucent. The gonocerci are large, inflated /also means "swollen"/, and of a yellow color. -- Head is entirely strongly convex /sic/ (see above) /sic/. Front and face have a white coating, with long white hairs; vertical triangle is very narrow and long; ocelli are located at the vertices of an isosceles triangle, and are shifted strongly forward. Mesothorax is shiny and black-blue, with 2 narrow, white longitudinal bands which do not extend to the scutellum. Abdomen is black, slightly shiny, with 3 pairs of narrow, white-powdery, crescent shaped spots; hypopygium is black, with black hairs; gonocerci are large, inflated /also means "swollen"/ resembling a bladder, are yellow in color, and translucent. 8 mm. USSR: Central and southern Eur-

opean part (Ryazanskaya and Khar'kovskaya oblasti, and Crimea). Europe.

..... E. ornatus Mg. 1822. Verrall 1901:602; Sack 1932:410.

-- leucopygus Becker, 1921:69 (sec. typ., syn. nov.); Sack 1932: 404.

133(132) Eyes nearly naked. Line of contiguity of eyes is approximately one and one half times as long as the height of the frontal triangle. Antennae are light-yellow. At least the first pair of crescent shaped spots on the abdomen (on the 2nd tergite) are translucent, as a rule. Gonocerci are moderately large, slightly inflated, and of a yellow color. -- Close to E. ornatus in the other characteristics. 7 mm. USSR: Central Asia (Kopet-Dag, Gissarskiy mountain range and its foothills, lower reaches of the Vashkha river, and the area around Tashkent). Southern Europe.

..... E. lucidus Lw. 1848. Loew 1848:134; Sack 1932:405.

134(131) The line of contiguity of the eyes is approximately the same length or shorter than the height of the frontal triangle.

135(136) Third sternite has a triangular /sic/, longitudinal, scaly process which bears a tuft of long white upright hairs on its cephalad region. -- Fore coxae are reddish yellow /entirely/ up to their basal end. Hind tibiae are very strongly thickened in the region on their distal end /i.e., distal half/. Face and front have a yellowish white coating and long hairs which are also yellowish white. Vertical triangle is moderately wide; ocelli are located on the vertices of an isosceles triangle near the middle /sic/ of the --i.e., lateral median cephalic vertex area. Antennae are yellowish brown. Mesothorax is a bronze-green, shiny, with 2 moderately wide, white longitudinal bands. Legs are black-green with a metallic luster; /but/ the fore coxae, the tro-

chanters of all pairs of legs, the distal ends of the femora, the basal part (one third to one half) of the tibiae, the distal end of the tibiae, and the greater portion of the tarsi, are all reddish yellow. Abdomen has 3 pairs of narrow, gray, crescent shaped spots; hypopygium has black hairs; 4th sternite has a deep triangular indentation on its caudad edge. 7 to 8 mm. USSR: Central and southern European part (Kurskaya, Belogorodskaya, and Khar'kovskaya oblasti; and Crimea). North Africa.

..... E. clavatus Beck. 1921. Becker 1921:70; Sack 1932:399.

136(135) Third sternite is simple, lacks a process and lacks a tuft of long hairs.

137(138) Third and 4th tergites have very long, soft, light-colored, upright hairs on the sides of the tergites (Fig. 25). -- Eyes have moderately dense and long white hairs. Front and face have a white coating and long yellowish white hairs. Vertical triangle is relatively wide; ocelli are located on the vertices of an isosceles triangle in the middle /sic/ -- i.e., lateral median of the cephalic vertex. The 3rd segment of the antennae is yellowish red to reddish brown. Mesothorax is a bronze-green, is coarsely dotted /i.e., with relatively large dots/, slightly shiny, and has traces of 2 longitudinal bands of a white coating. Legs are black, with the joints and the basal ends of the tibiae brownish yellow. Abdomen is a bronze-green, is slightly shiny, and has 3 pairs of white crescent shaped spots; hypopygium has light-colored hairs; the 4th sternite has a shallow, arc-shaped indentation on its caudad edge. 5 to 6 mm. Southern Europe; Asia Minor; and North Africa.

..... E. pulchellus Lw. 1848. Loew 1848:130; Sack 1932:411.

-- ? terminalis Abreu, 1924, Mem Acad. Cienc. Art. Barcelona,

XIX, 1:136-138.

(Footnote: If the body is a golden color, the distance between the hindward ocelli is greater than that between the forward ocellus and the hindward ocelli, and the tibiae and tarsi are mostly yellow, see E. barbarus Coqueb. (Sec. 156, infra), which has rather long hairs on the sides of the 3rd and 4th tergites.)

(2nd paragraph of footnote: E. graecus Beck. (sec. typ.) also belongs to this group. It differs from E. pulchellus Lw. by being smaller (4 mm), having a body light-bluish-green in color, not bronze but rather almost black, and having light-reddish-yellow antennae. Found in Greece. (Becker, 1921: 62, 66, and 69.))

Fig. 25. Eumerus pulchellus Lw. Male. Abdomen, side aspect. /drawing/ -- original /with this work/

138(137) Third and 4th tergites have short hairs on their sides, which hairs as a rule lie down.

139(154) Hypopygium has black hairs. First segment of hind tarsi is elongated, with length equal to or greater than that of the 4 subsequent segments of the corresponding tarsus taken together; 3rd segment of the hind tarsi is short, with a length equal to or less than the width of that segment.

140(141) Tibiae and tarsi of all pairs of legs are reddish yellow over their entire extent. -- Eyes nearly naked. Face and front have a coating and fairly long hairs, both snowy-white. Vertical triangle is

relatively wide, metallic green in color, heavily dotted, and with the corners /sic/ covered by a white coating; the ocelli are located at the vertices of an oblique triangle: the distance between the hindward ocelli is a little greater than that between the forward ocellus and the hindward ocelli (Fig. 26 - 1). Antennae are light reddish yellow. Mesothorax is a bronze-green or gold color, heavily dotted, lightly wrinkled, and having 3 white bands in its cephalad part, which bands are not always very noticeable. Abdomen is a bronze-green color, with 3 pairs of white, crescent shaped spots; 4th tergite has a yellow border at its caudad edge; 4th sternite has a deep, nearly rectangular indentation (Fig. 26 - 3); hypopygium has short black hairs; gonocoxites are bifurcated at their distal end, and have numerous branched outgrowths on their internal side (Fig. 26 - 4). 5 to 6 mm. USSR: Turkmeniya.

..... E. transcaspicus Stack. 1952. Stackelberg 1952:393-395.

Fig. 26. Eumerus transcaspicus Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Fourth sternite; 4 - Gonocoxite.

-- from Stackelberg

141(140) At least the tibiae, in their distal half, are black or dark brown.

142(145) Fourth tergite has a relatively wide yellow border at its caudad edge. Front and face have a white or grayish coating.

143(144) Vertical triangle is mostly covered with a grayish white coating. Basal segments of the antennae are light-yellow. Eyes are nearly naked. Fourth sternite has a deep triangular indentation, and /this sternite/ lacks dense black hairs on its sides. -- Face and front have a coating as well as long hairs which features are both snowy white. Vertical triangle is moderately wide; ocelli are located at the vertices of an isosceles triangle (Fig. 27 - 1). Antennae are a light reddish yellow. Mesothorax is metallic green, shiny, with small dots, and has 2 fairly wide longitudinal bands of a white coating. Legs are a dark bronze-green; /but/ the trochanters, the distal ends of the femora, the basal half of the tibiae, and the tarsi, are all dark yellow. Abdomen is a bronze-green, with 3 pairs of relatively wide crescent shaped spots of a white coating; hypopygium has black hairs. 5 to 6 mm. USSR: Central Asia (lower reaches of the Vakhsh river).

..... E. tugajorum Stack. 1952. Stackelberg 1952: 392-393 /lit., "293" -- evident error/.

144(143) Vertical triangle is black-blue, with a metallic luster. Basal segments of the antennae are black. Eyes have weakly developed whitish hairs. Fourth sternite of the abdomen has a narrower indentation on its caudad edge than in E. strigatus Flln. (see Sec. 119, supra, and Fig. 24); the edge of this indentation is in the shape of teeth; and the tip /sic -- also means "distal"/ corner of /this/ sternite bears dense black hairs. -- Front and face have

a whitish gray coating. Vertical triangle is a little narrower than in E. strigatus Flln. Mesothorax is black or dark bronze-green, with 2 weakly developed longitudinal bands of a light-colored coating and short, upright yellow hairs. Abdomen is like that of E. strigatus Flln., but 4th tergite has a relatively wide yellow border on its caudad edge; the hairs on the tip /sic -- also means "distal"/ part of the 4th tergite and on the hypopygium are relatively short, and are black. 6.5 to 7 mm. Most of Europe, from central Sweden to Spain and Italy; definitely not established in the USSR.

..... E. ruficornis Mg. 1822. Lundbeck 1916:541; Sack 1932:414.

Fig. 27. Eumerus tugajorum Stack. Male. 1 - Head, top aspect; 2 - Antenna.
-- from Stackelberg

145(142) Fourth tergite is metallic green or black over its entire extent up to the tip (distal end); if the caudad edge of the 4th tergite has a fairly wide border of a reddish brown coating (E. kongosanensis), then the face has a blackish gray coating and yellow hairs.

146(147) Face has a blackish gray coating and yellow hairs. Caudad edge of 4th tergite has fairly wide border of a reddish brown coating. -- Eyes are naked. Vertical triangle is relatively long and narrow, black, shiny, with coarse (i.e., relatively large-sized) dots and black hairs. Antennae are reddish yellow. Mesothorax is like that of E. strigatus Flln. but has brown hairs. Legs are black; /but/ the joints are reddish yellow, along with the basal end of the tibiae, and the tarsi are reddish brown; hind femora are strongly thickened; hind tarsi are broadened; 1st segment of the hind tarsi is longer than all the subsequent segments of the corresponding tarsus taken together. Abdomen is black with a purple tinge, and has 3 pairs of crescent shaped spots of a white coating; the hairs which cover the abdomen are relatively long; the hypopygium is large. 8 mm. Korea.

..... E. kongosanensis Shir. 1930. Shiraki 1930:93; Sack 1932:403.

147(146) Face has a white coating and white hairs. Caudad edge of the 4th tergite lacks a border comprising a reddish brown coating.

148(151) Mesothorax and abdomen have coarse /i.e., relatively large/ and densely spaced rasp-shaped /sic/ dots /e.g., may be nodules/ and fine wrinkles, and are slightly shiny; the distance between the dots is clearly less than the dimension of the individual dot.

149(150) Middle femora have numerous small wart-like growths on the hind-ventral /sic -- evidently means "distal part of the ventral"/ side. Third segment of antennae is wide (Fig. 28 - 2). -- This segment is barely longer than it is wide. The 4th sternite has a deep triangular indentation on its caudad edge, which indentation extends to approximately half the (front-to-hind) extent of the ster-

nite. Eyes have short, sparse hairs. Face and front have a gray coating and white hairs. Vertical triangle is relatively narrow; ocelli are located (on the cephalic vertex) at the vertices of an isosceles triangle. Antennae have a wide, reddish brown 3rd segment. Body is a black-bronze-green, with coarse /i.e., relatively large sized/ dots, and is slightly shiny. Mesothorax lacks longitudinal bands of a white coating. Legs are a dark bronze color, /but/ the distal end of the femora and the basal third of the tibiae are reddish yellow; and the tarsi are black. The abdomen has 3 pairs of nearly straight spots of a white coating; the hypopygium has short black hairs. 6 mm. USSR: Northern Kazakhstan.

..... E. rezvoi Stack. 1952. Stackelberg 1952:386-387.

Fig. 28. Eumerus rezvoi Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Hind leg.
-- from Stackelberg

150(149) The hind-ventral side /i.e., distal part of the ventral side/ of the middle femora is smooth, lacking wart-like growths. The 3rd segment of the antennae is an elongated oval shape, with length more than twice its width. The 4th sternite has a deep rectangular indentation, occupying most of /the area of/ the sternite, in

which a plate /e.g., sclerite or scale or membrane/ is located which bears longitudinal ridges. -- Eyes are nearly naked. Face and front have a coating and hairs, of a silvery white color. Vertical triangle is relatively wide; ocelli are located at the vertices of an equilateral triangle. Third segment of the antennae is reddish brown. Mesothorax is a dark bronze-green, has coarse /i.e., relatively large/ dots, and a nearly dull finish, and in its cephalad half nas 3 weakly developed, narrow longitudinal bands of a white coating. Legs are black-bronze in color, /but/ the joints, and the basal end of the tibiae, are brownish yellow; and the fore and middle tarsi are mostly brownish yellow; the hind femora are strongly thickened. Abdomen is a black-bronze color, slightly shiny, and has 3 pairs of narrow crescent shaped spots of a white coating; the hypopygium has short black hairs; the 4th sternite has a peculiar structure (see supra). 5 to 6 mm. Southern USSR: Crimea. Southern Europe and northern Iran.

..... E. basalis Lw. 1848. Loew 1848:126. Sack 1932:388.

-- ? cretensis Szilady, 1940, Ann. Mus. Nat. Hung., 33:68 (partim).

151(148) Mesothorax and abdomen have small dots and barely noticeable wrinkles, and are very shiny; the distance between dots is greater than the dimension of a dot.

152(153) Vertical triangle is relatively wide. The white spots of the 4th tergite resemble short oblique brush strokes. -- Eyes definitely have hairs, but these are short. Face and front have a coating and hairs, with both coating and hairs being snowy white. Antennae are reddish brown. Mesothorax is a bronze-green color, has small dots, is shiny, and has 2 narrow longitudinal bands of a white coating. Legs have great color variations /in a single sic -- i.e., could mean

specimen/; as a rule they are black with the joints and the basal part (one half) of the tibiae; more rarely, the distal end of the tibiae and the basal segments /sic -- i.e., "segment"/ of the fore and middle tarsi are also yellow. Abdomen is a black-blue, and is shiny, with 3 pairs of narrow, short, crescent shaped spots of a white coating; the hypopygium has black hairs. 5 to 7 mm. USSR: Central Asia (Gissarskiy mountain range). Southern Europe; North Africa; and Asia Minor.

..... E. amoenus Lw. 1848. Loew 1848:132; Efflatoun 1922: 109-111; Efflatoun Bey /sic/ 1926, Bull. Soc. Entom. Egypte, X:297-301; Sack 1932:396.

153(152) Vertical triangle is narrow. The white spots of the 4th tergite are longer /than in amoenus/, and have a slightly falcate bend. -- Close to the preceding /i.e., E. amoenus/. Body bluish black, with a steel-colored iridescence. Face and front have a silvery white coating and pure white hairs. Mesothorax is very shiny, and has 2 clearly developed longitudinal bands of a white coating which are readily noticeable in the cephalad half of the mesothorax. Legs are black, /but/ the distal third of the fore and middle femora, the distal end of the hind femora, and the basal part (one half, in the fore and middle legs, and one third, in the hind legs) of the tibiae and /sic/ tarsi, are all reddish yellow; and the distal segments /sic -- i.e., "segment"/ of the tarsi are dark-colored. 5 to 8 mm. Northeast Africa. Larvae inhabit the giant broomrape Cistanche.

..... E. cistanchei Effl. 1926. Efflatoun 1926, Bull. Soc. Entom. Egypte, X:297-301.

154(139) Hypopygium has soft white hairs. First segment of hind tarsi is moderately elongated, /but/ with length less than the combined length of the 4 more distal segments on the same leg; length of the 3rd segment of the hind tarsi, with rare exceptions (E. barbarus Coqueb. and E. arnoldii Stack.) is clearly greater than its width (as a rule, by a factor of 1.5).

155(158) Third segment of hind tarsi is short and wide: it is clearly wider than it is long (as a rule, twice as wide). Mesothorax has clearly developed longitudinal bands of a white coating.

156(157) The hind/ward/ row of spines on the lower /(ventral)/ surface of the hind femora is developed over nearly the entire extent of the femur up to its basal end. Eyes have dense but fairly short, white hairs. Fourth tergite is a gold-green up to /i.e., as far as/ its distal end, and has a metallic luster. -- Body is a bronze-green or golden color, and shiny. Front and face have a silvery white coating and silvery white hairs. Vertical triangle is relatively short and wide; ocelli are located at the vertices of a nearly equilateral triangle. Antennae are a light reddish yellow. Mesothorax and abdomen have fairly long, dense, upright, golden-yellow hairs; mesothorax has 2 clearly developed longitudinal bands of a white coating which reach nearly to the scutellum. Legs have strongly compressed /i.e., flattened/ hind femora; femora are for the most part metallic-green; the distal end of the femora, the tibiae (except for the distal third, which is brown), and the tarsi, are all reddish yellow. The abdomen has 3 pairs of crescent shaped spots of a white coating; the hypopygium has white hairs; the 4th sternite has a deep rectangular indentation bearing a pair of triangular processes in its basal part. 7 to 8 mm. Southern Europe; and North Africa.

..... E. barbarus Coqueb. 1804. Sack 1932:398.

Fig. 29. Eumerus arnoldii Stack. Male. Hind leg.
-- from Stackelberg

157(156) The row of hindward /lit., "hind row of"/ spines on the lower /(ventral)/ surface of the hind femora is developed only in the distal half of the femur (Fig. 29). Eyes are nearly naked. Fourth tergite has a wide yellow border on its caudad edge. -- Face and front have a white coating and white hairs. Vertical triangle is relatively narrow and long; ocelli /lit., "eyes" -- obviously an error/ are located at the vertices of an equilateral triangle near the center /sic/ -- i.e., lateral median of the cephalic vertex. Basal segment of the antennae is black, and the 3rd segment is reddish yellow. Mesothorax is a metallic green color, has small dots, is shiny, and has 2 relatively wide longitudinal bands of a white coating. Legs are a metallic green, /but/ the joints, the basal half and distal end of the tibiae, and the tarsi, are all reddish yellow. Abdomen is a metallic green, with 3 pairs of fairly wide crescent shaped spots of a white coating; hypopygium has white hairs; 4th sternite has a deep triangular indentation on its caudad edge, which indentation extends to the base /sic/ of the sternite. 8 mm.

USSR: Turkmeniya: sandy deserts, on the giant broomrape Cistanche.

..... E. arnoldii Stack. 1952. Stackelberg 1952:387-388.

158(155) Third segment of hind tarsi not shortened, but is about 1.5 times as long as it is wide; if the 3rd segment of the hind tarsi is relatively short (with length approximately equal to width), then the mesothorax lacks longitudinal bands of a white coating.

159(160) /lit., "156(160) -- obvious error/ The longitudinal bands of a light-colored coating on the mesothorax either are completely not developed /i.e., absent/ or are present only as traces on the cephalad edge of the mesothorax. Fourth tergite has a yellow border on its caudad edge. -- Eyes have short, sparse hairs, and indeed are nearly naked. Face and front have a white coating and long white hairs. Vertical triangle is relatively narrow and long; ocelli are located at the vertices of an isosceles triangle. Antennae have a dark brown basal segment and a yellowish red 3rd segment. Mesothorax and scutellum are metallic green or bluish in color, with short but dense, upright whitish (whitish gray) hairs. Legs are black, /but/ distal end of femora, basal half and distal end of tibiae, and tarsi, are all reddish yellow. Abdomen is a metallic green, with 3 pairs of crescent shaped spots of a white coating; 4th sternite has a deep triangular indentation on its caudad edge; 4th tergite has a yellow border on its caudad edge. 7 to 9 mm. China (Ala Shan /desert/, and Inner Mongolia). Females are not known.

..... E. acuticornis Sack. 1933. Sack 1933, Ark. f. zoologi, 26A, 6:8.

160(159) Longitudinal bands of a light-colored coating on the mesothorax are quite pronounced. 4th tergite lacks a yellow border on its

caudad edge, and is shiny over its entire extent.

161(162) Eyes have dense white hairs of moderate length. Vertical triangle is wide: its height is much less than twice the width of its base; the distance from a hindward ocellus to the edge of /the nearest/ eye is clearly greater than the diameter of the ocellus (Fig. 30 - 1). -- Face and front have a white coating and long white hairs. Vertical triangle is short and wide; ocelli are located at the vertices of an isosceles triangle. Mesothorax is metallic green or bronze in color, has small dots, is shiny, and has 2 longitudinal bands of a white coating. Femora and the distal half of the tibiae are dark bronze-green; /but/ the distal end of the femora, the basal half and distal end of the tibiae, and the tarsi, are all reddish yellow. Abdomen is metallic-green or bronze in color, with 3 pairs of moderately wide crescent shaped spots of a white coating; hypopygium has white hairs; 4th sternite has a deep, stepped indentation on its caudad edge (Fig. 30 - 4), with large paddle-shaped processes on the sides of the indentation; gonocoxites have a peculiar shape, and have dense hairs on their dorsal side (Fig. 30 - 5). 7 to 8 mm. USSR: Central Asia (Gissarskiy mountains, /at an altitude of/ 1000 to 2500 m).

..... E. turanicus Stack. 1952. Stackelberg 1952:395-396.

162(161) Eyes have short, sparse hairs. Vertical triangle is narrower /than in turanicus/: its height is clearly greater than twice the width of its base; the distance from a hindward ocellus to the edge of /the nearest/ eye is approximately equal to the diameter of the ocellus, or less than it.

163(164) Third segment of the antennae is relatively wide, reddish brown or dark brown to black in color. The line of contiguity of the eyes

is approximately as long as the height of the frontal triangle. The veins in the forward field of the wings (sc and r_1), with the exclusion of the basal end, are brown or black-brown (see Sec. 119, supra).

..... E. strigatus Flln. 1817.

Fig. 30. Eumerus turanicus Stack. Male. 1 - Head, top aspect; 2 - Head, side aspect; 3 - Antenna; 4 - Fourth sternite; 5 - Distal part of hypopygium. -- from Stackelberg

164(163) Third segment of antennae is relatively narrow, light reddish yellow in color. Line of contiguity of the eyes is clearly shorter than the height of the frontal triangle. The veins of the forward field of the wings (sc and r_1) /lit., "se" instead of "sc" -- obvious error/ are yellow, /right/ up to the distal end.

165(166) Third segment of the antennae has an elongated rectangular shape, with a straight upper edge (Fig. 31 - 2). Face and front have a grayish white coating. Vertical triangle is narrower /than in turanicola/ (its height is approximately 3 times the width of its

base), and is covered with a grayish coating. Hind trochanters are convex on the underside. Fourth sternite has relatively wide side lobes (Fig. 31 - 3); gonocoxites have an anchor-shaped broadening on their distal end (Fig. 31 - 4), as in E. strigatus Flln. -- In the remaining characteristics, close to E. turanicola Stack. (Sec. 166, supra). 7 mm. USSR: Uzbekistan (Kattakurganskaya oblast'). China (Sinkiang).

..... E. roborovskii Stack. 1952. Stackelberg 1952:398-400.

Fig. 31. Eumerus roborovskii Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Fourth sternite; 4 - Hypopygium.

-- from Stackelberg

166(165) Third segment of the antennae is relatively short, is triangular, and has an arcuate upper edge (Fig. 32 - 2). Face and front have a showy-white coating. Vertical triangle is wider /than in roborovskii/ (it is approximately 2.5 times as high as it is wide at its base), is shiny, and lacks a coating. Hind trochanters are barely convex on their underside. Fourth sternite has relatively

narrow side lobes on its caudad edge (Fig. 32 - 3); gonocoxites are bifurcated on their distal end, and have a large, slightly sclerotized /sic -- i.e., chitinized/ triangular process on their ventral side (Fig. 32 - 4). -- Body is metallic-green, bronze-green, or golden in color. Ocelli are located at the vertices of an isosceles triangle. Mesothorax is shiny, and has 2 longitudinal bands of a white coating. Femora and the distal half of the tibiae are a dark bronze-green; the distal end of the femora, the basal half and distal end of the tibiae, and the tarsi, are all reddish yellow. Abdomen has 3 pairs of moderately wide crescent shaped spots of a white coating. 5 to 7 mm. USSR: Central Asia (Gissarskiy and Darvazskiy mountain ranges, /altitudes of/ 1000 to 1500 m).

..... E. turanicola Stack. 1952. Stackelberg 1952: 396-398.

Fig. 32. Eumerus turanicola Stack. Male. 1 - Head, top aspect; 2 - Antenna; 3 - Fourth sternite; 4 - Hypopygium.

-- from Stackelberg

Females

1 (46) Abdomen is partly or largely red, or at least the 2nd tergite or the 2nd and 3rd tergites have a red or a yellowish brown spot on each side.

2 (25) Antennae black.

3 (10) First to 3rd segments of the fore and middle tarsi are yellowish white on the underside; 2nd and 3rd segments of the fore and middle tarsi each have a sharply limited black spot near the basal end.

4 (5) Ocelli located at the vertices of an equilateral triangle. Eyes naked. Mesothorax has coarse /i.e., relatively large/, frequent dots, is slightly shiny, and has 2 longitudinal bands of a white coating. Abdomen mostly red. 7 to 8 mm.

..... E. tarsalis Lw. 1848.

6 (7) Smaller: 5 to 7 mm. Mesothorax has coarse, frequent dots. Sides of the thorax have short hairs. Eyes are naked. Mesothorax is slightly shiny, has very short, semi-lying-down hairs, and has 2 longitudinal bands of a white coating. Abdomen is mostly red.

..... E. sabulonum Flln. 1817.

7 (6) Larger: 8 to 11 mm. Mesothorax has fine, frequent dots. Sides of thorax have longer hairs (see also Secs. 79 and 80, infra).

8 (9) Eyes have long, relatively dense hairs. Mesothorax has longer, upright hairs. Hind tibiae are brownish yellow in their basal third. 8 to 11 mm.

..... E. ussuriensis Stack. 1952.

9 (8) Eyes nearly naked. Mesothorax has shorter, upright hairs. Hind tibiae are brown only at the extreme basal end. 8 to 10 mm.

..... E. djakonovi Stack. 1952.

10 (3) Fore and middle tarsi are mostly black or brown.

11 (16) Mesothorax has short, semi-lying-down hairs.

12 (13) Hind femora are reddish yellow. -- Front and face are black-blue, and shiny; front is fairly wide, and has transverse wrinkles. Hind ocelli are farther from each other than the forward ocellus is from the hindward ocelli. Antennae are moderately large, and black. Mesothorax has coarse /i.e., relatively large/, dense dots, is slightly shiny, and has vestiges of longitudinal bands of a white coating on its cephalad edge. Legs are black or black-brown, /but/ the underside of the fore and middle femora, and the entire extent of the hind femora, are reddish yellow. Abdomen is red with its basal end and distal part (distal half of the 4th tergite and entire 5th tergite) black; there are weakly developed crescent-shaped spots of a white coating. 9 mm. USSR: Crimea. Male unknown. Close to E. tricolor Mg.

..... E. tauricus Stack. 1952. Stackelberg 1952:375-376.

13 (12) All femora are black.

14 (15) Third segment of antennae is very wide; nearly as wide as the cephalic front. The longitudinal bands of a white coating on the mesothorax are developed approximately to the level of the base of the wings /i.e., they extend in the caudal direction until they are about even with the bases of the wings/. The distal end of the abdomen is black; the crescent shaped spots of a white coating on the abdomen are well developed. 8 to 9 mm.

..... E. annulatus Pz. 1798.

15 (14) Third segment of the antennae is small, much narrower (little more than half the width) than the cephalic front. The longitudinal bands of a white coating on the mesothorax are developed only near

its cephalad edge. The abdomen, as a rule, is red up to the caudal end; the crescent shaped spots of a white coating on the abdomen are weakly developed. 7 to 10 mm.

..... E. tricolor Mg. 1822.

16 (11) Mesothorax has fairly long, upright hairs.

17 (20) The longitudinal bands of a white coating on the mesothorax are well developed.

18 (19) Hind femora are strongly thickened. Mesothorax and scutellum have coarse /i.e., relatively large/ and frequent dots, and are slightly shiny. 6 to 9 mm.

..... E. ovatus Lw. 1848.

19 (18) Hind femora are slightly thickened. Mesothorax and scutellum have small dots, and are very shiny. 9 to 10 mm.

..... E. sinuatus Lw. 1855.

20 (17) The longitudinal bands of a white coating on the mesothorax are scarcely noticeable, in the form of fairly small spots on the cephalad edge of the mesothorax.

21 (22) Abdomen has a fairly small triangular yellowish brown spot on each side area of the 2nd tergite. Body is dark bronze in color. Eyes have dense, long hairs. Mesothorax has small spots, is shiny, and has traces of longitudinal bands of a white coating. Legs are a bronzish green, /but/ the distal end of the femora and the basal half of the tibiae are brownish yellow. Abdomen has 3 pairs of crescent shaped spots of a white coating, which spots are widened in the middle similarly to the shape of a drop. 11 to 12 mm.

..... E. kozlovi Stack. 1952.

22 (21) Abdomen has large red spots on each side of the 2nd to 4th tergites.

23 (24) Hind femora are long and thin, barely thickened /in the middle/.

/only/
Basal half of the hind tibiae is yellowish white. r_{4+5} over R_5 is slightly bent. 10 to 11 mm.

..... E. tadzhikorum Stack. 1949.

24 (23) Hind femora are strongly thickened. Hind tibiae are a narrow /i.e., monochrome/ brownish yellow near the basal end. r_{4+5} over R_5 is strongly bent /i.e., curved/. 8 to 10 mm.

..... E. ursiculus Stack. 1949.

25 (2) At least the 3rd segment of the antennae is yellow, reddish yellow, or reddish brown.

26 (27) Front and face are mostly covered with a dense, light-gray powder. Mesothorax has wide longitudinal bands of a gray coating, which extend up to the scutellum. Legs are yellow; on the upper side /(dorsal side)/ of the hind femora ahead of the distal end there is sometimes a dark (black) smear. 8 to 10 mm.

..... E. jacobsoni Beck. 1913.

27 (26) Front and face for the most part have a metallic luster, and lack a powder. Mesothorax is either entirely shiny or with only traces of longitudinal bands of a white coating, said traces being found on its cephalad part. At least the fore and middle femora are mostly black.

28 (33) Hind femora are red, at least on the basal half.

29 (30) Eyes have fairly short, but dense, hairs. Hind femora are broadly /sic/ black /apparently means multiple shades of black are present/. 10 to 12 mm.

..... E. falsus Beck. 1921.

30 (29) Eyes nearly naked. Hind femora are either reddish yellow over their entire extent or else are black only at their extreme distal end.

31 (32) Hind femora slightly thickened, and are red up to their distal end. Hind tibiae are yellowish white on their basal half. Wings have a

large, diffuse, smoky spot in their distal half (to the outside of the branching r_{2+3} + r_{4+5}). 9 to 11 mm.

..... E. selevini Stack. 1949.

32 (31) Hind femora are clearly thickened, and have a narrow black ring /running around their girth/ at the distal end. Hind tibiae are black up to their basal end. Wings are nearly transparent, and lack a smoky spot. -- Front is wide, with coarse /i.e., relatively large/ dots, is shiny, and is black; face is a shiny black. Antennae are reddish yellow; 3rd segment of them has a wide oval shape. Mesothorax and scutellum are black, with coarse dots, and are slightly shiny; mesothorax lacks longitudinal bands of a white coating. Legs are black, /but/ joints, the basal end of the middle femora, and the hind femora are reddish yellow; and the fore and middle tarsi are brown. r_{4+5} over R_5 has a well defined but not deep bend /i.e., curve/. Abdomen is red and shiny, with caudal end brown; /the/ crescent shaped spots of a white coating are barely developed. 9 mm. Northern Iran. Male unknown.

..... E. persicus Stack. 1949. Stackelberg 1949:433-434.

33 (28) Femora of all pairs of legs are black, sometimes with the exception of only the extreme distal ends of the femora.

34 (39) Second and 3rd tergites of the abdomen are mostly red.

35 (36) Front is narrow: clearly narrower than the 3rd segment of the antennae. Mesothorax has 2 clearly developed longitudinal bands of a white coating. -- Eyes have very short hairs, and are /indeed/ practically naked /i.e., the hairs are sparse/. Face and front are shiny black; face is nearly twice as wide as the cephalic front. Third segment of the antennae is red and has an oval shape. Mesothorax and scutellum are a metallic black color, and have two

very pronounced longitudinal bands of a white coating. Legs are black, /but/ the distal end of the femora, the basal half of the tibiae, and the first 3 segments of the fore and middle tarsi are reddish yellow; hind femora are elongated, and slightly thicker than those of the fore and middle pairs /of legs/. Distal half of the wings is dark gray. Abdomen is red over most of the area of its 2nd and 3rd tergites; the crescent shaped spots of a white coating on the 2nd to 4th tergites are clearly developed. 10 mm. Syrian region of the United Arab Republic. Male unknown.

..... E. rubescens Vill. 1911. Villeneuve 1911, Bull. Soc. Amis. Sci. nat. Rouen:6; Sack 1932:413.

36 (35) Front is relatively wide, not narrower than the 3rd segment of the antennae. Mesothorax has only barely noticeable traces of longitudinal bands of a white coating on its cephalad edge.

37 (38) Hind femora are very strongly thickened: their width in the middle is greater than 3 times the middle width of the /corresponding/ tibia; on the underside of the hind femora in the distal third there is a projecting keel /sic/ which bears 8 to 10 short, knife-shaped spines. Face has a white coating. 8 to 9 mm.

..... E. lunatus F. 1794.

38 (37) Hind femora are moderately thickened: their width in the middle is approximately 2 times the middle width of the /corresponding/ tibia; hind femora lack a keel on the underside in the distal third, /but/ have fairly long, sharp spines, distributed in two rows. Face is shiny black. -- Eyes have short but dense hairs. Front is moderately wide, is black, has coarse /i.e., relatively large/ dots, and is slightly shiny. Ocelli are located at the vertices of a nearly equilateral triangle. Antennae have a moderate sized, oval shaped,

yellowish red 3rd segment. Mesothorax and scutellum are black, have coarse /i.e., relatively large/ and frequent spots, and are slightly shiny; mesothorax lacks longitudinal bands of a white coating. Legs are black; /but/ the basal half of the tibiae and the 1st segment of the middle tarsi are yellow; and the fore and middle tarsi are mostly brown. Wings are grayish; r_{4+5} over R_5 has a distinct but not strong bend /i.e., curve/. Abdomen is entirely red, with 3 pairs of weakly developed crescent shaped spots of a white coating. 10 mm. Israel (Jerusalem). Male unknown. ..... E. palaestinensis Stack. 1949. Stackelberg 1949:434-435.

39 (34) Second and 3rd tergites, or only the 2nd tergite, of the abdomen have a red or brownish yellow triangular spot on each side.

40 (41) Entire 5th tergite of the abdomen is reddish yellow. -- Face and front are narrow, and have a dense /i.e., substantial/ white coating and long white hairs. Ocelli are located at the vertices of a nearly equilateral triangle. Third segment of the antennae is large and reddish brown. Mesothorax and scutellum are a shiny black-green, with dense light-gray hairs; mesothorax has 2 clearly developed longitudinal bands of a gray coating. Legs are black, /but/ the joints and the basal part /i.e., section/ of the tibiae are reddish yellow; hind femora are thickened; legs /as a whole/ have long, dense white hairs. Abdomen is black, with red spots on each side of the 2nd tergite, and with 3 pairs of crescent shaped spots of a white coating, /one pair/ on /each of/ the 2nd to 4th tergites; the hairs covering the deep-/sic/ colored parts of the abdomen are black, and those covering the remaining parts of the abdomen are white. 10 mm. USSR: Turkmeniya. Male unknown. ..... E. grisescens Beck. 1921. Becker 1921:64 and 68;

Sack 1932:401.

41 (40) Fifth tergite of abdomen is a metallic green, sometimes with a narrow-yellow /i.e., monochrome yellow/ caudad edge.

42 (43) Eyes have short, relatively sparse hairs. Mesothorax and scutellum have short, semi-lying-down or upright (on the scutellum) white hairs. -- Front is narrow, occupying about one seventh of the width of the head, is black and shiny, has large dots, and has a gray coating at the borders of the eyes; ocelli on the cephalic vertex are located at the vertices of an isosceles triangle; face is shiny black, with white hairs. Antennae are reddish yellow; the 3rd segment is large and has the shape of a short egg, with its /i.e., the 3rd segment's/ length scarcely greater than its width. Mesothorax and scutellum are nearly black, are slightly shiny, have fine dots, and have fine wrinkles; mesothorax has 2 longitudinal bands of a white coating, and has semi-lying-down, short, but dense, white hairs. Legs are black; /but/ the distal end of the femora, the basal two thirds of the tibiae, the distal end of the tibiae, and the underside of the tarsi, are all yellow; hind femora are fairly strongly thickened, and on their underside in the distal half they have 2 rows of large spines, with approximately 10 spines in each row. Wings are transparent; basal ends of the wings are light-yellow; r_{4+5} over R_5 is distinctly but not strongly bent /i.e., curved/; the humming elements are light yellow. Abdomen is flat, with the shape of an elongated triangle which narrows toward the caudal end; it is black, and has 3 pairs of very wide crescent shaped spots of a white coating, /one pair/ on /each of/ the 2nd to 4th tergites, and with all /of these spots/ having short, white hairs which lie down. 11 to 12 mm. Southern Iran. Male unknown.

..... E. persarum Stack., sp. n.

Bemnur /sic/, Iranian Belugistan /sic/, 11 x 1955 (2 females: holotype and paratype, /by/ Shcherbinovskiy; collection of the Zoological Institute of the AN SSSR, in Leningrad).

43 (42) Eyes have long, dense hairs. Mesothorax and scutellum have long, dense, upright white hairs.

44 (45) Hind femora are slightly thickened. Wing ocellus is deep brown. Front, face, mesothorax, and scutellum have very dense, long white hairs which nearly hide the basic colored background /of the body wall/. Larger /than turkmenorum/: 11 to 13 mm.

..... E. ammophilus Par. 1927.

45 (44) Hind femora are clearly thickened. Wing ocellus is light-brown to nearly transparent. Front, face, mesothorax, and scutellum have shorter, sparser, white hairs which do not hide the basic colored background. Smaller: 10 to 11 mm.

..... E. turkmenorum Par. 1927.

46 (1) Abdomen is metallic-green, blue, or black over its entire /sic/ extent, and lacks red or yellow spots on the sides of the 2nd and 3rd tergites, but sometimes has a more or less wide yellow or brownish border on the caudad edge of the 4th tergite.

47 (90) Antennae are black or black-brown.

48 (49) Antennae are long and narrow, with the length of their 2nd segment being approximately equal to the length of their 3rd segment.

49 (48) Antennae have the ordinary structure, /with/ the length of the 2nd segment much less than that of the 3rd.

50 (55) Hind femora have a protruding ridge underneath and to the side, ahead of the distal end, which ridge bears a row of spines.

51 (52) Smaller / than (52)/: 6.5 to 7.5 mm. Hind tibiae have long, up-

right white hairs.

..... E. obliquus F. 1805.

52 (51) Larger /than obliquus/: 10 to 11 mm. Hind tibiae have short, light-colored hairs which lie down.

53 (54) Eyes have short but dense hairs.

..... E. olivaceus Lw. 1848.

54 (53) Eyes nearly naked.

..... E. nudus Lw. 1848.

55 (50) Hind femora lack a protruding ridge on the underside in the distal third; the forward (external) /sic/ row of spines rests on the body of the femur itself.

56 (57) Hind tibiae have a definite oblique indentation or groove /e.g., infolding/ on the ventral side in the distal half. Mesothorax lacks a longitudinal band of a light-colored coating on its sides. 5 mm.

..... E. emarginatus Lw. 1848.

57 (56) Hind tibiae lack an oblique indentation or groove on the ventral side in the distal half, or if they have a groove (E. gussakovskii Stack.) then the mesothorax has a longitudinal band of a light-colored coating on its (the mesothorax's) sides.

58 (59) Mesothorax lacks longitudinal bands of a white coating. 7 to 8 mm.

..... E. hissaricus Stack. 1949.

59 (58) Mesothorax has longitudinal bands of a white coating.

60 (61) Hind femora have 2 or 3 large spines underneath in the middle, sometimes isolated and sometimes positioned so as to seem a continuation of the interior /sic/ row of spines of the distal part of the femur; in the latter case the centrally located spines differ from the others by being thicker. 5 to 7 mm.

..... E. sulcitibius Rd. 1869.

61 (60) Hind femora lack large spines on the underside in the middle.

62 (63) Hind femora have a gently sloping tubercle (Fig. 12 - 1) on the underside near the basal end. 5 to 6 mm.

..... E. tuberculatus Rd. 1857.

(Footnote: Also, apparently, the still unknown females of E. caucasicus Stack. and E. reichardti Stack. belong here.)

63 (62) Hind femora lack a tubercle on the underside near the basal end.

64 (75) Mesothorax has a more or less wide, longitudinal band of a whitish gray coating on each side, said band being developed from the shoulder tubercle to the folding tubercle, or at least to the base of the wings.

65 (66) The middle longitudinal bands of a light-colored coating on the mesothorax[1] are developed over the entire extent of the latter from its cephalad edge to the scutellum; their width is more or less uniform over their entire length; as a rule they merge ahead of the scutellum, forming a more or less straight-edged quadrilateral containing a light-colored powder /lit., "dust"/.

..... E. rushanicus Stack. 1952.

66 (65) The longitudinal bands of a light-colored coating on the mesothorax clearly narrow as they extend hindwardly, and as a rule they do not reach the scutellum; further, there is no developed area of light-colored powder or dust /on them/ ahead of the scutellum.

67 (68) Legs are black, but the joints alone may be a narrow /sic -- i.e., monochrome/ yellowish brown. 8 to 9 mm.

..... E. latitarsis Macq. 1838.

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[1] The "middle" bands of a coating on the mesothorax are located approximately at the level of the outer /sic/ corner of the scutellum.

68 (67) At least the basal third of the fore and middle tibiae is yellow.

69 (72) The middle /i.e., medial/ band of a light-colored coating on the mesothorax is clearly developed.

70 (71) The middle bands of a white coating on the mesothorax are relatively wide, and extend practically to the scutellum.

..... E. kondarensis Stack. 1952.

71 (70) The middle bands of a white coating on the mesothorax are narrow and extend only to the transverse suture.

..... E. punctifrons Lw. 1857.

72 (69) A middle band of a light-colored coating on the mesothorax is wanting.

73 (74) Ocelli are located at the vertices of an equilateral triangle. Hind trochanters have a fairly small tubercle on the underside. Hind tibiae have an oblique groove on the ventral side in the distal half. 8 to 10 mm.

..... E. gussakovskii Stack. 1949.

74 (73) Ocelli are located at the vertices of an isosceles triangle. Hind trochanters lack a tubercle on the underside. Hind tibiae lack an oblique groove on the ventral side in the distal half. 6 to 8 mm.

..... E. purpureus Macq. 1838.

75 (64) The shoulder tubercle and the sides of the mesothorax are shiny, lacking a coating.

76 (81) Face lacks a coating or has a barely noticeable gray coating, and has a metallic luster.

77 (78) Fore tarsi are brown over their entire extent. Width of the 3rd segment of the fore tarsi equals or is a little greater than its length. Eyes are nearly naked. 8 to 10 mm.

..... E. chrysopygus Sack, 1941.

(Footnote: Another member of this group is E. angustifrons Lw. (sec. typ.), which is characterized by smaller size (5 mm), an elongated 3rd segment of the antennae (length of the segment nearly twice its width), and narrow white crescent shaped spots on the abdomen. Asia Minor. (Loew, 1848))

78 (77) First 3 segments of fore tarsi are yellowish white, at least on the underside; 2nd and 3rd segments of these same tarsi have a black spot underneath, near the basal end. Length of the 3rd segment of the fore tarsi exceeds the width of that segment.

79 (80) Eyes have dense, long, light-colored hairs. Mesothorax and abdomen have longer /than in (80)/, upright hairs; hairs of the abdomen are mostly light-colored. Abdomen is a deep olive-green, with a metallic luster. Hind tibiae are brownish yellow on their basal third. 8 to 11 mm.

..... E. ussuriensis Stack. 1952.

80 (79) Eyes nearly naked. Mesothorax and abdomen have shorter hairs which are semi-lying-down; the hairs covering the abdomen are mostly black. Abdomen is black, with a slight metallic luster, often with a red spot on each side of the 2nd tergite, or else abdomen is mostly red (see Sec. 9 (females), supra). Hind tibiae are brown only on the extreme basal end. 8 to 10 mm.

..... E. djakonovi Stack. 1952.

81 (76) Face has a dense /i.e., substantial/ white or grayish coating.

82 (85) Crescent shaped spots of a white coating are developed only on the 2nd and 3rd tergites of the abdomen, and are wanting in the 4th tergite.

83 (84) Body is a deep bronze-green or an olive-green. Mesothorax has a quite pronounced medial longitudinal band of a light-colored coating

which is developed, along with middle /(transverse)/ bands, approximately up to the level of /i.e., as far hindward as/ the base of the wings. Mesothorax has small, dense dots, and is slightly shiny. 7 mm.

..... E. sibiricus Stack. 1952.

84 (83) Body is a light metallic-green. Mesothorax lacks a medial band of a light-colored coating, has relatively coarse /i.e., large/, densely spaced dots, and is shiny. 6 to 7 mm.

..... E. pauper Beck. 1921.

85 (82) A pair of crescent shaped spots of a white coating is developed on each of the 2nd to 4th tergites of the abdomen.

86 (87) Tarsi are reddish yellow or brownish yellow over their entire length, both on the top side and underneath. Eyes have dense hairs. 7 to 8 mm.

..... E. bactrianus Stack. 1952.

87 (86) Tarsi are mostly a deep brown or black-brown, at least on their top /(dorsal)/ side.

88 (89) Third segment of the antennae is wider /than in (89)/, with length /only/ 1.25 times its width. Eyes have sparse hairs (eyes practically naked). Tarsi are black or black-brown over a greater portion of their extent. 6 to 8 mm.

..... E. strigatus Fllн. 1817.

89 (88) Third segment of the antennae is narrower, with length about 1.5 times its width. Eyes have denser, although short, hairs. Tarsi are reddish yellow, at least on their underside. 7 to 8 mm.

..... E. sogdianus Stack. 1952.

90 (47) Antennae are yellow, reddish yellow, or reddish brown.

91 (98) The "crescent shaped" spots on the 2nd tergite are translucent.

92 (93) Face has black hairs. 6 to 7 mm. (Shiraki, 1930)

..... E. okinawaensis Shir. 1930.

93 (92) Face has white hairs.

94 (95) Longitudinal bands of a light-colored coating are wanting on the mesothorax. 6 to 8 mm.

..... E. japonicus Mats. 1915.

E. elegantissimus Stack. 1930.

95 (94) Longitudinal bands of a light-colored coating are clearly developed on the mesothorax, at least /as far hindward as/ up to the transverse suture.

96 (97) Third segment of the antennae is rounded /e.g., resembling a sphere/ (it is scarcely longer than it is wide). Fourth segment of hind tarsi is wide (it is approximately 1.5 times as wide as it is long). 7 mm.

..... E. flavitarsis Zett. 1843.

97 (96) Third segment of antennae has an oval shape (it is 1.25 times as long as it is wide). Fourth segment of hind tarsi is not wide (it is clearly longer than it is wide). 7 mm.

..... E. lucidus Lw. 1848.

98 (91) None of the crescent shaped spots on the abdomen is translucent.

99(100) Longitudinal bands of a light-colored coating on the mesothorax are not developed; mesothorax is shiny. 8 to 10 mm.

..... E. mesasiaticus Stack. 1949.

100(99) There are clearly developed longitudinal bands of a light-colored coating on the mesothorax.

101(102) Hind tibiae have a distinct indentation on the ventral side ahead of the distal end. 4.5 to 5.5 mm.

..... E. pusillus Lw. 1848.

102(101) Hind tibiae lack an indentation on the ventral side ahead of the

distal end.

103(106) At least the fore tibiae and tarsi are yellow over their entire extent.

104(105) Lower distal corner of the 3rd segment of the antennae is rounded. Front has a metallic luster, except at the border with the eyes, at which location (and only there) it has a white coating. The bands of a white coating on the mesothorax are narrow and extend only to the transverse suture. 6 to 7 mm.

..... E. transcaspicus Stack. 1952.

105(104) Lower distal corner of the 3rd segment of the antennae is quite pronounced /i.e., not round/. Front has a metallic luster, and /i.e., but/ is covered in its middle part with a white coating. The bands of a white coating on the mesothorax are wider, and extend /in the hindward direction/ to the level of the base of the wings. -- Eyes are nearly naked. Front and face are a shiny metallic-green; front is narrow: its width at /sic/ the cephalic vertex is one fifth the width of the head; front has dots in its middle part, has a white coating, and has short white hairs. Antennae are red; their 3rd segment is moderately large. Mesothorax and scutellum are a metallic green, are shiny, and have short, light-yellow hairs. Trochanters, the distal end of the femora, the tibiae, and the tarsi with the exception of the 1st segment of the hind tarsi, are all reddish yellow. Wings are transparent; r_{4+5} is not bent. Abdomen is black, with 3 pairs of quite pronounced crescent shaped spots of a white coating; caudal end of abdomen has white hairs. 6.5 mm. Syrian region of the United Arab Republic. Male unknown.

..... E. pallidifrons Beck. 1921. Becker 1921:70.

106(103) At least the tibiae (in their distal half) are darkened (brown or

black) over a more or less substantial part of their extent.

107(112) Fore coxae are yellow.

108(109) Third segment of antennae is large, with a shape resembling a sphere. The crescent shaped spots of a white coating on the abdomen are narrower /than in (109)/. The caudad edge of the 4th tergite is black. 7 to 8 mm.

..... E. clavatus Beck. 1921.

109(108) Third segment of antennae is of moderate size, with an elongated oval shape (approximately 1.5 times as long as it is wide). Crescent shaped spots of a white coating on the abdomen are wide. Caudad edge of 4th tergite of abdomen is yellow or yellowish brown.

110(111) The occiput has a metallic luster in its upper part behind the eyes; a coating is wanting. Mesothorax has 2 longitudinal bands of a white coating; but a median longitudinal band is wanting. 5 to 6 mm.

..... E. tugajorum Stack. 1952.

111(110) Occiput has a dense /i.e., substantial/ white coating on its upper part behind the eyes. Mesothorax has 3 longitudinal bands of a white coating: the median longitudinal band is clearly developed, although narrow. 7 to 8 mm.

..... E. arnoldii Stack. 1952.

112(107) Fore coxae are mostly black or dark brown.

113(116) Mesothorax and abdomen have coarse /i.e., relatively large/ and frequent rasp-shaped /sic/ dots and fine wrinkles, have a nearly dull surface, and have very short hairs which lie down.

114(115) Mesothorax has 3 light-colored longitudinal bands, the middle one of which is very narrow. 5 to 6 mm.

..... E. basalis Lw. 1848.

115(114) Mesothorax has 2 light-colored longitudinal bands. 9 to 10 mm.

..... E. rusticus Sack, 1932.

116(113) Mesothorax and abdomen have small dots, and are shiny.

117(118) Abdomen has only 2 pairs of crescent shaped spots of a white coating, one pair on each of the 2nd and 3rd tergites. 6.5 to 7.5 mm.

..... E. graecus Beck. 1921.

118(117) Abdomen has 3 pairs of crescent shaped spots of a white coating, one pair on each of the 2nd to 4th tergites.

119(122) Ocelli* on the cephalic vertex are shifted forward: the distance of the hindward ocelli from the line connecting the hindward corners /sic/ of the eyes is greater than the distance between the forward /ocellus/ and the hindward ocelli.

(Footnote: Evidently certain specimens unknown to the Author in nature also belong here, namely those of E. okinawaensis Shir. (Shiraki, 1930:95), which have non-translucent spots on the 2nd tergite of the abdomen. See also Sec. 92 (females), above.)

120(121) Third segment of antennae has a wide oval shape (scarcely longer than it is wide), and a reddish brown color. Larger /than (121)/: 8 mm.

..... E. ornatus Mg. 1822.

121(120) Third segment of antennae has an elongated oval shape (its length is not less than 1.5 times its width), and a light reddish yellow color. Smaller: 6 mm.

..... E. argyropus Lw. 1848.

122(119) Ocelli are located on the hindward part of the vertex: the distance of the hindward ocelli from the line connecting the hind corners of the eyes is not greater than the distance between the forward /ocellus/ and the hindward ocelli.

123(124) Front is densely wrinkled in its middle part over its entire span (from eye to eye), with wrinkles surrounding dots; and it is slightly shiny. 6 to 8 mm.

..... E. barbarus Coqueb. 1804.

124(123) Front is more or less densely dotted in its middle part, but without wrinkles; it is shiny or else covered with a light-colored coating.

125(130) Eyes have dense, relatively long white hairs.

126(127) Larger /than (127)/: 9 to 11 mm. Front is narrow, with its upper part being about one sixth as wide as the head, and is a shiny black color; the coating on the front is developed only at the edges of the eyes.

..... E. richteri Stack. 1960.

127(126) Smaller: 7 to 8 mm. Front is wide, with its upper part being over one fifth the width of the head, is shiny, lacks a coating or else is covered with a dense /i.e., substantial/ white coating on its middle part, and is entirely a metallic green color.

128(129) Hind tarsi are black.

..... E. ruficornis Mg. 1822.

129(128) Hind tarsi are reddish yellow.

..... E. turanicus Stack. 1952.

130(125) Eyes are nearly naked.

(Footnote: Evidently E. kongosanensis Shir. (Shiraki, 1930:93), which is unknown to the Author in nature, also belongs to this group.)

131(132) Front is covered over nearly its entire extent with a white coating. Abdomen is mostly covered with black, short hairs which lie down.

132(131) Front is shiny over nearly its entire extent, lacking a coating. Abdomen is mostly covered with light-colored hairs which lie down. ..... E. amoenus Lw. 1848.

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Insert

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11. The European species of the genus Eumerus.

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/Species Index follows, with synonyms in italics./