Studies on *Cerceris* of North Eastern Asia (Hymenoptera, Sphecidae)

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Contents

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I. INTRODUCTION AND GENERAL SURVEY

Historical Review

The taxonomic studies on the wasps belonging to the genus *Cerceris* LATREILLE (1802) that occur in the north-eastern regions of Asia were first started by the English Entomologist, F. SMITH, in his well-known 'Catalogue of the Hymenopterous insects in the collection of the British Museum' published in 1856. In this work he described a considerable number of new species from China and Siberia. His descriptions were, however, so simple and superficial that they give us today almost no definite clue, excepting few, in determining species among those so delicately close to one another. In 1873 he also dealt with a species of this genus in his descriptions of new species of the Japanese Hymenoptera. In 1877 O. RADOSZKOVSKY published a report on the Hymenoptera of Turkestan which has a close relation to the region covered by the present paper based on the collection obtained by the famous FEDTSCHENKO's travel. His descriptions, together with those published before and after this (1869, 86, 88, and 93) were much like those of SMITH and gave rise to not a less confusion among the later investigators. Just a decade later, in 1887, the important monograph of the wasps of this genus was published by A. SCHLETTERER. In this work he redescribed and rproduced all the palaearctic species known up to that time, adding a number of descriptions of new species (including some made by F. F. KOHL) and arranged all the possible ones into a key. Among his new species were included a considerable number originated from Central and West Asia and some from the regions concerned in the present treatise. Two years later (1889a and b) his supplementary work to the above monograph appeared. From towards the time of appearance of SCHLETTERER's work during several years a large number of species of *Cerceris* were described from various localities of the mid-northern Asiatic regions by F. MORAWITZ (1889, 90, 91, 92, 93 and 94). His descriptions were very detailed and acculate and are of great value still towards the present-day investigators. Towards the end of the nineteenth and early in the twentieth century F. SICKMANN (1895), F. F. KOHL (1898a and -b), A. MOCSÁRY (1901), W. A. ASHMEAD (1904) and J. PÉREZ (1905) touched more or less upon the species of *Cerceris* collected in north-eastern Asia. With regard to these authors mention will be made more fully in the region concerned respectively. From 1910 to 1925 several contributions were made exclusively on the group of *Cerceris* occurring in the wide regions of mid-northern Asia by the Russian author, A. SHESTAKOV (1912, 14, 15, 18, 22 and 23). Many of the species described by him have directly or indirectly much to do with those found in the regions in question. Especially his 1922 paper is important. During the same period S. MATSUMURA made

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the first record of the genus as the Japanese entomologist. KOHL (1915) revised the material dealt with previously by RADOSZKOVSKY.

More recently, several papers including distributions and descriptions of the species of the genus under investigation from the Asiatic continent and Japan were published by S. SATO (1927), H. BISCHOFF (1930), V. GUSSAKOVSKIJ (1933, 36, 38 and 52) and K. YASUMATSU (1935a and -b, 36, 37 and 42).

As regards the species occurring in the adjacent regions lying to the south of the range covered by the present paper which have stronger connection with the Oriental zoological region descriptions and records have been conducted either fragmentally or systematically by F. SMITH (1856), H. de SAUSSURE (1867), E. STRAND (1913), K. YASUMATSU (1936) and J. GINER MARI (1942, 43).

On the other hand, in the western Palaearctic region the wasps of the genus were successively summarized or newly described during the early half of the present century either in the faunal books or separately in the papers dealing with a certain area (O. SCHMIEDEKNECHT, 1907, 30; L. BERLAND, 1925; A. MOCHI, 1938; J. GINER MARI, 1941a and b). But the most important ones have consecutively been published very recently by J. DE BEAUMONT (chiefly 1950, 51a, -b, -c, 57a, -b, 58, 60a and -b) who dissolved many of the nomenclatorial problems that had seriously been confused up to his time and added a number of new species from the south-western areas of the Palaearctic region. His essential redescriptions of the known species and detailed explanations of the new species are most valuable in comparing characters of the specimens of our regions with those of the western forms, since quite naturally there occur not a less number of the same species or their local forms in north-eastern Asia.

Most recently (April, 1961) J. VAN DER VECHT published the important paper, 'Hymenoptera Sphecoidea Fabriciana' (Zool. Verh., 48). In this he dealt with synonymy of 16 species of *Cerceris* appeared in FABRICIUS's work, some of which have a direct relation with the form occurring in our region.

Material

The material dealt with in this investigation was chiefly collected by myself, especially so the specimens from Japan, Korea, North China and East Mongolia. But a considerable number in the Korean examples and some of the Japanese ones were derived from the collection of the TAKEUCHI Entomological Laboratory in Kyoto. The source of all the Manchurian specimens was the private collection of Mr. P. M. F. VERHOEFF, Den Dolder, Netherlands. Besides the above I must mention that some locally interesting material from Japan were forwarded by twos and threes from my friends below stated.

Acknowledgement

Since my attempt of the present investigation I have received various sorts of kind help from many friends and colleagues. First of all I desire to acknowledge my indebtedness to Mr. P. M. F. VERHOEFF, Den Dolder, Netherlands, who not only kindly placed at my disposal so many valuable specimens of *Cerceris* from his collection of the Manchurian Sphecidae, but also lent me for my comparative study a number of specimens of the European representatives including

several rare species. My hearty thanks are also due to Dr. K. TAKEUCHI, Kyoto, for the loan of the valuable specimens of the Korean as well as the native *Cerceris*. I am indebted much to Drs. W. J. PULAWSKI, Wrocklaw, Poland and F. J. SUAREZ, Almeria, Spain, for their kind help in obtaining some of the literature which were unaccessible to me in this country as well as in affording several useful specimens for my study. I am also indebted to Prof. K. YASUMATSU, Fukuoka, for his support in examining some of the specimens used in the present investigation. Finally I wish to express my sincere gratitude to Drs. R. OHGUSHI, Kyoto, T. SHIROZU, Fukuoka, S. F. SAKAGAMI, Sapporo, S. OHBA, S. SATO and H. HASEGAWA, Tokyo, for their kind help either in preparing microfilms of some of the literature or in affording some of the specimens.

General Survey

The species included in the following key to the species of *Cerceris* occurring in the regions dealt with here were enumerated up to 47 comprising 10 subspecies. Their distri bution in the regions conventionally separated in this paper was as given in Table 1.

Of these the best studied is, of course, Japan, excepting southern areas that belong to the Oriental region. But the number of the species found in this country is only 9, including 2 new or unrecorded species. The scanty of the species number is, however, a phenomenon commonly met with in the island fauna. The following must particularly be mentioned. It has been believed that most of the species known in Japan were endemic to the country or at least endemic to the restricted areas of East Asia. But the present revisional investigation revealed that only 2 are, so far known, endemic, 2 are common to eastern Continental fauna and the remaining 5 are the species (usually represented by the geographical races) that are widely distributed over the range of the Palaearctic region, but that had been known in Japan under the different species names. In the last group *rybyensis* and *eversmanni* have not been known from East Asia, but probably they will be found by the future research.

Of the Korean *Cerceris*-fauna it is not as yet the time to discuss about its faunal problems, since the number of the species dealt with in this paper is considered not representing even a half of the true fauna. As far as known, however, the *Cerceris*-fauna of this peninsula seems of considerable interest in the comparison with that of Japan. The species common to both regions are 5 in number of which 3 (*hortivaga, albofasciata* and *arenaria*) are the cosmopolitan, 1 (*pedetes*) is the north-eastern Asiatic and only 1 (*sobo*) is the endemic to both the regions. On the other hand, the number of the species occurring in Korea and not in Japan is by far more abundant than the above-mentioned group. Among these some certainly represent easternmost distridution of the wide-spread species (*e.g. sabulosa, bicincta, 4-fasciata, ruficornis*), others (*e.g. pedetes, koreensis*) have a direct connection with the ajacent continental regions and the remainder is, so far known, endemic. Two somewhat interesting phylogenetic problems will de presented below, one of which concerns with *C. hortivaga* and the other with *coreensis*.

C. hortivaga in Korea is considerably variable in the abdominal maculation, whereas in the specimens of Japan it is, on the contrary, fairly constant. In the Japanese representatives *hortivaga* (=*harmandi* auct.) is easily separable from the allied *rybyensis japonica* by the different pattern of the abdominal maculation. In Korea, however, local race of *rybyensis* has not yet been discovered. (This is an interesting faunistic problem of itself.) But *hortivaga* (? = *unifasciata* Smith)

Table 1. *Cerceris* of north eastern regions of Asia and their distribution

Group name	Species name	Locality						
		Japan	Korea	N. China	Manchuria	E. Mongolia	E. Siberia	Europe
rybyensis	*rybyensis japonica* Ashmead	*						(*)
	hortivaga Kohl	*	*	*				*
	sabulosa subgibbosa Yasumatsu		*		*			(*)
	sabulosa sinica subsp. nov.			*				
	sabulosa nupta Shestakov				*	*		
	solskyi Radoszkovsky			*				
	distinguenda Shestakov			*				
	harbinensis sp. nov.				*			
	pekingensis sp. nov.			*				
	pekingensis alini subsp. nov.				*			
	pekingensis mongolica subsp. nov.					*		
	gibbosa Sickmann			*				
	supraconica sp. nov.		*					
sobo	*sobo* Yasumatsu et Okabe	*	*					
rubida	*rubida* Jurine			*	*	*		*
	carinalis Pérez	*						
	nipponensis sp. nov.	*						
	koma sp. nov.		*					
	verhoeffi sp. nov.				*			
bupresticida	*bupresticida* Dufour			*				*
bicincta	*biciucta* Klug		*	*	*	*		*
albofasciata	*albofasciata* Rossi	*	*	*	*	*		*
arenaria	*jakowleffi* Kohl					*		
	coreensis sp. nov.		*					
	tiendang sp. nov.			*				
	grana Shestakov					*		
	arenaria Linné	*	*	*	*			*
	arenaria apakensis subsp. nov.					*		
	quadricolor F. Morawitz				*	*		
	flava sp. nov.					*		
	micropunctata Shestakov						*	
	adelpha Kohl		*		*	*		
	quadrifasciata Panzer		*		*			*
	quinquefasciata seoulensis subsp. nov.		*		*			(*)
	sungari sp. nov.				*			
	shaman Shestakov						*	
	ruficornis Fabricius		*					*
	manchuriana sp. nov.				*			
	hokkanzana sp. nov.		*					
	falcifera sp. nov.			*				
	pedetes Kohl	*	*		*		*	
	lacinia sp. nov.				*			
	sibirica F. Morawitz				*		*	
	koryo sp. nov.		*					
	gegen sp. nov.					*		
	eversmanni teranishii Sato	*						(*)
rufipes	*rufipes evecta* Shestakov			*	*	*		(*)
	Total	9	16	14	19	13	4	13

is common and abundant and in maculation it contains a form quite the same as *rybyensis japonica*.

As regards the faunae of the genus *Cerceris* in North China, Manchuria and East Mongolia the localities from which the material is derived are too restricted, namely Peking, Harbin and Apaka respectively. They can therefore afford only some distributional data toward the detailed faunistic investigation in future. I can, however, give here an instance of such faunistic problems suggesting a speciation that occurred.

The three species, *coreensis* from Korea, *tiendang* from North China and *jakowleffi* from East Mongolia, have a close interrelationship among them. In colorific characters the females of the species above mentioned are far apart from each other and quite easily separable. The first of them has the abdomen black, banded (some are interrupted in the middle) with yellow, the second has the same part anteriorly yellowish red and posteriorly black and with the whitish bands medianly widely interrupted, while in the last the abdomen is anteriorly broadly ferruginous yellow and only posteriorly black and without the bands or maculae. The character that can structurally separate them from each other and at the same time that shows their close mutual affinity is represented by the clypeus. The median lobe of it is most highly conical in *coreensis* (with the anterior aspect flattened) and rather coarsely punctured; the 6 apical teeth of the ground part are comparatively long and distinct. In *tiendang* it is less high, more rounded, rather hemispherical and slightly less coarsely punctured, with the intervals duplicated with the abundant microscopically fine points; anterior marginal teeth are shorter and less strong, but still well defined. While *jakowleffi* in Mongolia has the median lobe of the clypeus only slightly roundly swollen, with the anterior flattened area indistinctly represented; its punctures are fine and sparse and the apical margin with the teeth very short and indistinct. Punctuation of the body is comparatively coarsest in *coreensis*, medium state in *tiendang* and sparse and fine in *jakowleffi*. If the first and the last species only are examined we may hardly find the particular relationship between them. The second gives us a link connecting the two species. The close affinity among them is also represented by the presence of a small tubercle on their mesopleuron which is only a slight protuberance of one of the points of junction of the reticulated punctuation and likely to be overlooked. The same sort of evidence is further given by the closer resemblance between the males of *coreensis* and *tiendang* (in *jakowleffi* the male remains undiscovered). They can be distinguished from each other mainly by the slight difference in the state of the apical fringe of hairs of the 7th abdominal sternite and in coloration. Such being the case, it is somewhat questinable whether they should be treated as a distinct species respectively or as different geographical races (subspecies) of an identical species. I have rather conventionally placed them as separate. The future investigation of the specimens derived from the intermediate zones will make the final determination.

In general it seems to be a tendency that among the species occurring on the continent, especially in the northern inland areas those which have reddish coloration on the abdomen are comparatively abundant. In Japan and Korea there is no species known that have the reddish-coloured abdomen, while in the species captured in Peking (N.L. nearly 40°) 5 out of 14 (36 %) have the abdomen more or less coloured reddish. In those from Harbin (N.L. 40°45′) 5 out of 19 (26 %) belong to such species. In this case it should be kept in mind that several species are represented by the male sex only and therefore the true percentage will be raised when the

female specimens are examined, since in some species the reddish colour appears on this sex alone. In the case of the E. Mongolian specimens collected at Apaka (Mongolian Gegensum — N.L. about 44°) 7 out of 13 species, that is to say about 56 %, have the reddish-coloured abdomen.

Such colorific relation is also observed between subspecies of certain species. In the nominate form of *pekingensis* the reddish colour on the abdomen appears only on some examples and it is generally not deep. While in *pekingensis mongolica* from Apaka and in *pekingensis alini* from Harbin it is more distinct and more suffused. In *sabulosa subgibbosa* from Korea and southern Manchuria the abdomen is black maculated with yellow, but in *sabulosa sinica* it is basally broadly reddish and in *sabulosa nupta* the reddish colour is much more broadly spread over. The instance of the three allied species above-mentioned falls within the same category. As to the intraspecific colour variation in the European form an account is given by de Beaumont (1953) on *C. flaviventris*. Similar colorific relation is also observed widely in other groups of Hymenoptera, *e.g.* in Chrysididae, in which the continental representatives abound in the reddish coloration, while those of the island or coastal (as well as the southern) regions are rich in the bluish or greenish coloration.

Classification

The subdivision of the genus *Cerceris* has not yet been concordantly established. Shestakov (1923) divided it into two subgenera, *Apiraptrix* and *Cerceris* s. str. It is said that the wasps of the former subgenus possess the platform at the base of the 2nd abdominal sternite and show the habits of capturing bees as food for their young, while in those of the latter subgenus there is no platform of the 2nd sternite and they have the habits of hunting Coleopterous insects. Among the recent authors Giner Mari and Gussakovskij followed this mode of classification. But that such a classification is not only nomenclatorially but also biologically incorrect was already clearly pointed out by de Beaumont (1950a). Indeed, the division that involves *C. rybyensis*, if such is made, should be treated as *Cerceris* s. str., since it is the type of the genus. Hence *Apiraptrix* Shestakov comes to fall to a synonym of *Cerceris* s. str. and the second division should be named anew. Biologically the mode of division of Shestakov is not always correct. I can give here some biologically exceptional instances to the division that is characterized by having the platform at the base of the 2nd abdominal sternite. One of them concerns with *C. sobo* Yasum. et Ok. occurring in Japan and Korea. The female of this species has two small tubercles instead of the formal platform on the 2nd sternite, but the male has it fairly well defined. Notwithstanding it used to hunt Curculionid beetles as its larval food. The other instances come from *C. carinalis* Pérez and *C. nipponensis* Tsun., both occurring in Japan and both belonging to the group of *rubida*, but they have always the platform on the 2nd sternite. These two species also capture Curcurionid beetles as food for their young. The evidence above given seems sufficient to show impropriety of the Shestakov's classification.

Recently de Beaumont divided the members of *Cerceris* into several groups, instead of defining subgenera. In the present paper his grouping was followed as a rule, but several new ones were added. They were given in the first column of Table 1.

Key to the Species

The material employed in the present study is not sufficient except for the Japanese specimens, and a number of the unrecorded forms must be added in the future investigation. Moreover, even in the species dealt with here a considerable number was represented by one of the sexes alone. Such being the case it appears not as yet the time to prepare the key to the species occurring in N. E. Asia. However, I durst make it. The reason for this is that it will conveniently be utilized by the future investigators to take aim most easily whether or not the specimens before him belong to some species already known. It is also considered that the work will bring advantage also to myself to make most clearly the classification between and among some different species which are so close and similar that the ordinary descriptions of the respective species come to be completely of no use in making the final determination. In preparing the key I made some effort to involve all the species described from the regions in question. It was, however, very often impossible to do so, since most of the descriptions of the early authors are so simple and superficial, lacking the interpretation of the specific characters that are most usually employed by the present-day taxonomists. Such species were therefore unwillingly excluded from the key below presented.

Females

(The female of the tollowimg species remains unknown : *harbinensis*, *sungari*, *koryo*, *gegen*, *pekingensis alini*, and *arenaria apakensis*.)

1 Second sternite of abdomen at base with an elevated area (platform), sometimes well marked off, sometimes indistinctly outlined, and rarely represented by two tubercles only, 1st tergite without a small impression at apex in middle 2

– Second sternite of abdomen without platform at base, 1st tergite with a small impression at apex in middle 18

2 Clypeus with appendix before apex (usually the platform at base of 2nd sternite not well outlined, sometimes rather indistinct) 3

– Clypeus without appendix (usually the platform well outlined) 8

3 Clypeus with a tubercle at base in middle, ante-apical appendix bilobate, with apices rounded and raised – Fig. 16 – (elevation at base of 2nd sternite represented by two tubercles before middle, face yellow, abdominal tergite 3 with a broad yellow band, 1 and 5 a narrow band, anterior margin of fore wing clouded) length 12 – 15 mm, Japan (Kyushu) and Korea

***sobo* Yasumatsu et Okabe, 1936**

– Clypeus without a tubercle at base, ante-apical appendix simple, not raised high 4

4 Appendix of clypeus broad (as broad as long from base) medianly carinated with apex tridentate – Fig. 1 – (apical margin of ground portion shortly and bluntly quadridentate, 2 maculae on face, a broad band on tergite 3, a narrow one on 5 yellow, antero-apical margin of fore wing clouded) length 10–11 mm, Japan

***nipponensis* sp. nov.**

– Appendix of clypeus narrow (less than as broad as long from base), medianly not carinated, with apex truncate or emarginate 5

5 Area dorsalis on propodeum strongly punctured as on the rest of the segment, appendix emarginate or incised at apex (at least 2 maculae on face and 2 maculae on abdominal tergite

3 yellow or whitish yellow), length 6–7.5 mm, Manchuria, Mongolia, northern regions of China widely, Turkestan, Asia Minor, Cyprus and Europe

***rubida* (Jurine, 1807)**

– Area dorsalis with punctures not so strong as on the rest of the segment, fine and sparse (apical margin of clypeus more or less distinctly 3- or 5-dentate) 6

6 Median lobe of clypeus flattened, with appendix as large in apical width as the length of antennal scape; face wholly, clypeus except apex and supra-clypeal area yelllow (Thorax and abdomen rich in maculation), length 9 mm, Korea

***koma* sp. nov.**

– Median lobe of clypeus not flattened, with appendix less than as large in apical width as the length of antennal scape, face and clypeus black with yellow maculae 7

7 Median lobe of clypeus convex and broad, appendix very short and small, not raised apically, apical margin rather obscurely 3-dentate (punctures on mesonotum and propodeum fine and sparse, with very minute points in between, usually 2 maculae on face, 3 spots on clypeus and a band on tergite 3 and 5 yellow) length about 9 mm, Manchuria

***verhoeffi*, sp. nov.**

– Median lobe of clypeus medianly broadly raised and turned into appendix at apex which is somewhat large and long and slightly raised towards apex, apical margin distinctly 5-dentate (punctures on mesonotum and propodeum coarse and close, usually 2 maculae on face, a band on tergite 3 yellow), length 9–10.5 mm, Japan

***carinalis* Pérez, 1905**

8 Median lobe of clypeus wholly convex, without apical impression, supra-clypeal area gibbously produced (inner margins of eyes only slightly divergent below, pronotum well developed, punctures generally gross and dense, area dorsalis on propodeum indistinctly transversely striate, body and legs adorned with rich yellow maculation), length 8–10 mm, North China

***gibbosa* Sickmann, 1895**

– Median lobe of clypeus anteriorly more or less broadly impressed, supra-clypeal area not gibbous-convex 9

9 Median lobe of clypeus at base strikingly gibbous-conical and broadly inclined towards apex (Figs. 32, 33, in the lateral view), punctuation generally coarse and dense (abdominal tergite 2 at base, 3 and 5 broadly and 4 on each side maculated), length 13–14 mm, Korea

***supraconica* sp. nov.**

– Median lobe of clypeus not strongly gibbous and apically more or less broadly excavated ... 10

10 Median lobe of clypeus with basal elevation very slight, nearly flattened, apical margin raised and slightly reflected with an incrassate tooth on each side (Figs. 57 and 58), length 8.0–9.5 mm, North China and Mongolia

***pekingensis* sp. nov.** 11

– Median lobe of clypeus at base more or less distinctly but always gently convex, if the elevation slight, then with apex truncate or nearly so 12

11 Punctures generally sparse and not strong, on mesopleuron punctate-reticulate, propodeum usually black, tergites 1–3 light ferruginous, 1–5 with yellow apical band, length 8–9.5 mm,

N. China

***pekingensis* Tsuneki s. str.**

– Punctures sparser and weaker, on mesopleuron also sparse, propodeum always with 2 large maculae, tergites and sternites 1–4 and tergite 5 on apical half light ferruginous, length 7.5 mm, E. Mongolia

***pekingensis mongolica* subsp. nov.**

12 Legs with femora largely black (tergite 4 without a yellow band, if with it is very narrow and incomplete 13

– Legs with femora yellow or ferruginous, tergite 4 with a distinct yellow or yellowish band 14

13 Basal platform of sternite 2 transverse, with apex reaching only about 1/4 of the segment, antennal joint 3 about 1.7 times as long as wide at apex (in the narrowest view), femora of legs with underside also largely black (usually band on tergite 5 narrow and short)*, length 12–16 mm, Japan, Korea, N. China, Europe

***hortivaga* Kohl, 1880** (=*harmandi* auctt. nec Pérez ♀)

– Basal platform of sternite 2 semicircular or subtriangular, with apex reaching about 2/5 of the segment, antennal joint 3 twice as long as wide at apex (in the narrowest view), femora of legs with underside yellow (band on tergite 5 consisting of 2 large maculae confluented, punctures as coarse and dense as in *hortivaga*), length 13–16 mm, Japan

***rybyensis japonica* Ashmead, 1904** (*conj. nov.*)

14 Vertex or temples above with yellow maculae more or less developed, mesopleuron also maculated (pronotum well-developed and roundly elevated on latero-posterior portions, yellow maculae generally rich on thorax and abdomen) 15

– Vertex and temples without maculae, mesopleuron also immaculated (pronotum on postero-lateral portions not roundly swollen) 16

15 Area dorsalis on propodeum obliquely striate, OOD : POD=1.2 : 1, head and thorax black, yellow maculated (median lobe of clypeus 1.5 times as long as wide, with upper quarter gently convex, antennae above dark brown, beneath ferruginous yellow, abdominal segments yellow with a black macula at base of each tergite), length 8.5–9.0 mm, N. and N.W. China

***distinguenda* Shestakov, 1922**

– Area dorsalis grossly and sparsely punctate, OOD : POD=1.5 : 1, head and thorax yellow and black maculated (median lobe of clypeus with upper third nearly flattened, antennae ferruginous, penultimate joint above darkened, abdomen black, yellow maculated, sometimes basal tergite ferruginous with lateral yellow maculae), length 12–15 mm, N. China and Central Asia

***solskyi* Radoszkovsky, 1877** (=*dorsalis* Eversm. ♂, *caspica* F. Mor. ♂, *murgabica* Rad. ♀, ♂, ex parte)

16 Abdominal tergite 4 sparsely punctured, with intervals on an average larger than the points, abdominal segments 1–3, sometimes 4 also, ferruginous with yellow maculae or band

* In the specimens from Korea and North China the band is sometimes in the same state as in *rybyeusis iaponica* Ashmead.

(area dorsalis obliquely striate, median lobe of clypeus at base only very slightly convex, sometimes nearly flattened), length 7–11 mm, E. and W. Mongolia

***sabulosa nupta* Shestakov, 1922,** (*conj. nov.*)

– Abdominal tergite rather closely punctured, with intervals on an average smaller than the points, abdominal segments black or only 1 and 2 ferruginous, both yellow maculated (area dorsalis obliquely striate, median lobe of clypeus relatively wider than in the nominate race) 17

17 Abdominal segment 1 apically, 2 wholly and 3 basally ferruginous, length 11 mm, N. China

***sabulosa sinica* subsp. nov.**

– Abdominal segments wholly black, yellow maculated, length 10–11 mm, Korea and S. Manchuria

***sabulosa subgibbosa* Yasumatsu, 1935** (*conj. nov.*)

18 Median lobe of clypeus without particularly producing appendix, but sometimes nearly whole area roundly or subconically elevated 19

– Median lobe of clypeus with particularly producing appendix, sometimes at base, sometimes on ante-apical area 25

19 Median lobe of clypeus not particularly elevated 20

– Median lobe of clypeus markedly convex or subconical (antennal joint 3 nearly 2.3 times as long as wide at apex, area dorsalis on propodeum rugoso-striate) 23

20 Abdominal sternite 5 medianly broadly deeply excavated and bordered on posterior margin by a perpendicular lamella which is deeply incised in middle, legs black and yellow (anterior margin of clypeus broadly and bluntly quadridentate, with a row of irregular tubercles medianly just behind, body black, yellow maculated), length 10–13 mm, N. China, Turkestan, Central Asia and Europe

***bupresticida* Dufour, 1841**

– Abdominal sternite 5 without apical lamella, legs reddish yellow or ferruginous 21

21 Clypeus yellowish white, apically subtruncate, area dorsalis on propodeum rugoso-striate, abdominal tergites 3 and 5 only whitish maculated, sternite 5 at sides posteriorly produced into a stout tooth, pygidial area divergent towards base, wings wholly clouded, length 10–13 mm, Korea, Manchuria, N. China, E. Mongolia, Turkestan and Europe

***bicincta* Klug, 1835** (=*quadrimaculata* Dufour, 1849)

– Clypeus black 22

22 Clypeus flattened, coarsely punctured, with apex slightly raised and bilobate, accompanying on each side a small broad tooth produced, area dorsalis smooth and polished, abdominal tergites 2–5 with an ante-apical whitish band, sternite 5 without postero-lateral teeth, pygidial area roundly convergent towards base with lateral carinae confluent with each other, wings hyaline apically clouded, length 9–12 mm, Japan, Korea, Manchuria, E. Mongolia, N. China, Turkestan, Asia Minor and Europe

***albofasciata* (Rossi, 1790)** (=*luctuosa* Costa, *navitatis* Sm.)

– Clypeus not elevated, sparsely punctate, shining, slightly impressed toward apex, apex not dentate, gently truncate and provided with 2 tubercles (face, 2 maculae on pronotum,

postscutellum, abdominal segments 1–4 and legs ferruginous red, area dorsalis obliquely striate, punctuation generally sparse), length 9 mm, China

***grana* Shestakov, 1922**

23 Legs and abdomen black and yellow (median lobe of clypeus on basal 2/3 subconically elevated, with anterior aspect flattened and slightly excavated at its base, anterior margin weakly undulate with feeble indistinct tubercles along margin, 2 maculae on face, postscutellum, lateral maculae on tergites 1–4 yellow, legs largely black, mesopleuron with a small tooth on lower portion), length 12–13 mm, Korea

***coreensis* sp. nov.**

– Legs ferruginous, abdomen ferruginous and black, sometimes with white maculae (mesopleuron provided with a small short tooth on lower portion) 24

24 Abdomen ferruginous and black with white maculae (median lobe of clypeus except apical margin hemi-spherically elevated, with anterior aspect flattened in an equilateral triangle, apical margin 6-dentate, pygidial area slightly more than twice as long as wide), length about 10 mm, N. China

***tiendang* sp. nov.**

– Abdomen ferruginous and black, without white maculae (median lobe of clypeus except apical margin only gently roundly elevated, with anterior aspect flattened in a low isosceles triangle, apical margin without distinct teeth, pygidial area distinctly less than twice as long as wide at base, punctuation generally sparse, on tergite 4 with intervals distinctly larger than the points), length 8.3 mm, E. Mongolia

***jakowleffi* Kohl, 1898**

25 Appendix of clypeus detaching from the ground surface at a little distance from apical margin, the detached part short, with apex not highly raised 26

– Appendix of clypeus detaching from the ground surface at above middle of median lobe, with a considerable space between its base and apex of the ground portion 31

26 Appendix thin and lamellar, almost concealing the apical margin 27

– Appendix thick and stout, with apical margin of ground part visible 29

27 Lamellate appendix apically entire, either rectangular, subsemicircular, or subtriangular (Fig. 20) (punctures medium-sized, close, head and thorax with rich yellow maculae, abdominal segments 1–5 with a yellow band, legs reddish yellow), length 13–16 mm, Japan, Korea, S. Manchuria, E. Mongolia, N. China, Turkestan, Central Asia, Europe and N. Africa

***arenaria* (Linné, 1758)** (=*quinquecincta* Ashmead, 1904, nec Fabricius, 1787)

– Lamellate appendix apically deeply emarginate or incised 28

28 Abdomen basally ferruginous, apically black, each segment adorned with yellow or yellow and white band, puntures very fine, feeble and very sparse, length 12–15 mm, Manchuria, Mongolia

***quadricolor* F. Morawitz, 1889**

– Abdomen black and yellow, punctures medium-sized, not strong and moderately close (usually body largely yellow, black maculated), length 13–15 mm, E. Mongolia

***flava* sp. nov.**

29 Lateral margins of appendix parallel (apical margin of appendix thick, deeply roundly

emarginate, representing its own lower aspect, with the sides produced into lateral arms, detaching very little from the ground surface (Fig. 84), basal half of mandibles, appendix, 2 maculae on face, 2 spots on pronotum, tegulae, postscutellum, medially interrupted ante-apical bands on tergites 2–5 whitish or whitish yellow, area dorsalis obliquely clearly striate), length 8.5–10 mm, Korea, Manchuria and N. China

***adelpha* Kohl, 1887** (?=*associa* Kohl, 1898)

– Lateral margins of appendix convergent towards apex 29

29 Punctures generally extraordinarily fine (inner margins of eyes nearly parallel, propodeum very finely closely rugoso-punctate, area dorsalis very finely longitudinally striate, maculae on clypeus, face, sides of pronotum, tegulae, narrow bands on tergites 2–5 whitish yellow), length 10 mm, E. Siberia

***micropunctata* Shestakov, 1922**

– Punctures on head and thorax medium-sized (area dorsalis longitudinally, apically obliquely striate) 30

30 Hind legs largely black, front and mid legs up to end of femora black (appendix of clypeus fairly markedly convex, with apex thin, raised and truncate, its punctures medium-sized, sparse but distinct, maculae on clypeus, face, narrow bands on tergites 2–4 yellow, thorax wholly black), length about 11 mm, Korea, Manchuria and Europe

***quadrifasciata* (Panzer, 1799)**

– Legs except coxae and trochanters reddish yellow (appendix only gently convex, apically feebly carinate in middle, apex thick, not raised and slightly emarginate, punctures fine, sparser, with close microscopic points on intervals, maculae on clypeus, face, postoculus, pronotum, tegulae, postscutellum, bands on tergites 2–5 (sometimes interrupted in middle) white or yellowish white, abdomen basally reddish yellow), length 10–11 mm, Korea and Manchuria

***quinquefasciata seoulensis* subsp. nov.**

31 Mesopleuron with a tooth on lower portion 32

– Mesopleuron without a tooth on lower portion 33

32 Temples well-developed, in the lateral view slightly divergent below, mesopleural tooth stout and distinct (large species, 17–23 mm, appendix with sides parallel or slightly divergent towards apex, usually twice as wide as long and deeply incised at apex, rather bidentate (Fig. 77), body broadly yellowish- or reddish-ferruginously maculated), N. China as far westward as Kansu, E. Mongolia and Manchuria

***rufipes evecta* Shestakov, 1922** (*conj. nov.*)

– Temples not strongly developed, in the lateral view convergent below, mesopleural tooth small (length about 14 mm ?, clypeal appendix apically convergent as in *flavicornis*, separated by a semicircular, sometimes dentate carina from the lower margin, punctures duplicate on all parts, also on area dorsalis; face, clypeus more or less, lateral maculae of pronotum, tegulae, postscutellum, bands on tergites 2–5 yellow, legs red), E. Siberia

shaman* Shestakov 1922

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* According to Kolossou (1932) this is a synonym of *flavipes* Eversm., 1847. But the original descriptions of both species seems to show difference between them, so the Shestakov's name based on E. Siberian specimen was provisionally retained here.

33 Appendix of clypeus subconical, standing nearly vertically on the facial plane (Fig. 24) (lower aspect of appendix flattened, polished with sparse fine punctures, area dorsalis longitudinally striate, 2 maculae on face, a minute spot behind eye, postscutellum, medianly attenuate band on tergite 2–4, yellow, legs largely black, with front tibiae and tarsi mainly brown), length 12–13 mm, Japan

***eversmanni teranishii* Sato, 1927** (*conj. nov.*)

– Appendix more or less lamellate, with sides parallel or divergent (sometimes arcuately) towards apex 34

34 Apical margin of appendix nearly truncate 35

– Apical margin of appendix deeply emarginate or incised 36

35 Punctures generally very fine and weak, mixed duplicately with microscopic points, appendix large, semicylindric, in the dorsal view slightly wider than long, with sides slightly divergent towards apex (Figs. 100–102) (maculae on mandibles, clypeus, appendix, face, behind eyes, pronotum, tegulae, postscutellum and tergites 1–5 yellow, legs reddish yellow), length 13–14 mm, Manchuria

***manchuriana* sp. nov.**

– Punctures medium-sized in general, strong and distinct, appendix nearly 1/3-cylindric, in the dorsal view nearly as long as wide, with sides subparallel, (coloration as in the above species, bands on abdomen not interrupted in middle), length 10–12 mm, Korea, N. China (Kansu), Turkestan and Europe

***ruficornis* (Fabricius, 1793)** (=*cunicularia* Schranck, 1802)

36 Area dorsalis on propodeum smooth and shining, basal half of abdomen reddish yellow (appendix of clypeus slightly wider than long, deeply emarginate at apex, horseshoe-shaped (Fig. 63), with apices pointed, forming an angle of about 30° with the ground surface, punctuation fine and sparse, maculae on head and thorax and medianly interrupted bands on abdomen white), length 10 mm, N. China

***falcifera* sp. nov.**

– Area dorsalis striate, abdomen black with yellow bands 37

37 Sides of appendix nearly strait, subparallel, about twice as wide as long, deeply roundly emarginated at apex (Fig. 22) (maculae on mandibles, clypeus, face, antennal scape, behind eyes, on pronotum, tegulae, postscutellum, propodeum and bands on tergites 1–5 yellow, the bands comparatively narrow and medianly attenuate, legs slightly reddish yellow), length 15–17 mm, Japan, Korea, Manchuria and E. Siberia

***pedetes* Kohl, 1887**

– Sides of appendix arcuate, distinctly less than twice as wide as long, deeply emarginate at apex (Figs. 48, 90) 38

38 Appendix nearly as long as wide, apical emargination less than as deep as half a circle, punctures medium-sized, strong and close, on propodeum reticulate, legs largely black or dark brown), length 13 mm, Korea

***hokkanzana* sp. nov.** (?=*semilunata* Rad.)

– Appendix longer than wide, apical emargination nearly elongate semielliptic, apical margin of median lobe markedly produced, punctuation finer and sparser, especially on abdomen,

length 17–18 mm, Siberia (Minusinsk) and Manchuria (Harbin)
***sibirica* F. Morawitz, 1892**

Males

(The male of the following species remains unknown : *koma*, *distinguenda*, *grana*, *jakowleffi*, *micropunctata*, *shoyozana*, *shaman* and *sabulosa sinica*.)

1 Second sternite of abdomen with an elevated area (platform) at base, sometimes not well marked off, 1st tergite without a small impression at apex in middle 2

– Second sternite of abdomen without platform at base, most frequently 1st tergite with a small impression at apex in middle, rarely without 17

2 Punctures on area dorsalis on propodeum coarse and close, just as on other areas of the segment (clypeus except apex, face below antennae, tegulae, postscutellum, base of tergite 2, two maculae on 3 and 5 and legs from distal portion of femora apically yellow or yellowish white), length 6–7 mm, Manchuria, Mongolia, northern regions of China widely, Turkestan, Asia Minor, Cyprus and Europe
***rubida* (Jurine, 1807)**

– Sculpture on area dorsalis otherwise 3

3 Abdominal segment 1 distinctly longer than wide 4

– Abdominal segment 1 not longer than wide (in the dorsal view with the upper surface kept horizontal) 6

4 Area dorsalis at least on basal half smooth and polished, posteriorly finely punctured, punctuation of body generally comparatively fine and sparse, yellow band on tergite 6 as wide as that on 3, length 7.5–8.0 mm, Manchuria
***verhoeffi* sp. nov.**

– Area dorsalis finely punctured or rugoso-punctate or rugoso-striate, punctuation of body medium-sized, stronger and closer, band on tergite 6 much narrower than that of 3 (radial cell of forewing and its external area markedly darkened) 5

5 Median lobe of clypeus seen in profile highest toward (only slightly above) middle (usually head in front, antennal scape and pronotum more broadly yellow than in the following species), length 7–9 mm, Japan
***carinalis* Perez, 1905**

– Median lobe of clypeus seen in profile highest above middle (usually less rich in yellow maculation — especially on head — than in the preceding species)
***nipponensis* sp. nov.**

6 Area dorsalis on propodeum smooth and polished, only very feeble crenulation sometimes defined in lateral furrows (basal lobe of hind wing about 1/3 the length of anal cell)
***pekingensis* sp. nov.** 7

– Area dorsalis sculptured otherwise, if nearly impunctate the surface mat or with strong crenation in the lateral furrows 9

7 Punctuation comparatively finer and sparser, on tergite 4 intervals larger than the points (abdomen broadly yellow with intersegmental constriction ferruginous, only partly black on posterior portion, propodeum with 2 large yellow maculae), length 7.5–9.0 mm, E. Mongolia

***pekingensis mongolica* subsp. nov.**

– Punctuation comparatively coarse and close, on tergite 4 intervals generally smaller than the points (propodeum wholly black) 8

8 Abdomen black, with yellow bands on tergites 1–6, length 8–9 mm, N. China

***pekingensis* s. str.**

– Abdomen black, with tergite 1 at apex, 2 and 3wholly, reddish; tergite 3 with apical yellow band, legs more broadly black than in the nominate race, length about 8 mm, Manchuria

***pekingensis alini* subsp. nov.**

9 Supraclypeal area subcornically elevated, antennal joints 3 and 4 subequal in length (rich in yellow maculae, maculae on abdomen similar to *sabulosa*), length 7–8 mm, N. China

***gibbosa* Sickmann, 1895**

– Supraclypeal area not subconical in the lateral view, antennal joints 3 longer than 4 ··· 10

10 Antennal joint 8 longer than wide 11

– Antennal joint 8 shorter than, or as long as, wide 12

11 Median lobe of clypeus with a distinct tooth at apex in middle, with punctures rather sparse and separated from each other, medianly impunctate, basal platform on sternite 2 not well outlined apically, abdomen with a broad band on tergite 3 only, length 10 mm, Japan and Korea

***sobo* Yasumatsu et Okabe, 1936**

– Median lobe of clypeus with a very feeble indistinct projection at apex in middle, with surface as well as face coarsely rugoso-punctate all over, abdominal tergites 2, 3, 5, 6 with large maculae or broad band (on 4 fine), length 10 mm, Korea

***supraconica* sp. nov.**

12 Area dorsalis comparatively grossly and sparsely punctate, flagella of antennae nearly wholly reddish yellow (clypeus swollen with apex truncate, grossly punctate, as on other areas of face, body rich in yellow maculae, legs nearly wholly yellow), length 12–15 mm, N. China, Central Asia

***solskyi* Radoszkovsky, 1877** (Synonym : See p. 9)

– Area dorsalis striate, or rugoso-striate, at least on lateral portions, antennal flagella above largely black 13

13 Abdomen on anterior half ferruginous and yellow, on apical half black and yellow, legs largely yellow (area dorsalis on propodeum obliquely striate, basal platform of sternite 2 with apex only gently roundly produced), length 7.5–8 mm, E. Mongolia and China (Kansu)

***sabulosa nupta* Shestakov, 1922** (*conj. nov.*)

– Abdomen black and yellow 14

14 Punctures on body very coarse and strong, 15–16 in number across middle of mesonotum··· 15

– Punctures finer, 22–26 in number across middle of mesonotum 16

15 Basal platform of sternite 2 nearly transverse, with apex gently rounded, reaching 2/3 of the elevated area of the segment, antennal joint 3 in dorsal view slightly less than twice as long as wide at apex, a broad yellow band on tergite 3, sometimes also on 4 and 6, length 8–13 mm, Japan, Korea, N. China, Europe

***hortivaga* Kohl, 1880** (=*harmandi* Pérez et auct.)

– Basal platform of sternite 2 nearly semicircular (more roundly produced than in *hortivaga*), with apex reaching more than 2/3 of the elevated area of the segment, antennal joint 3 in dorsal view twice as long as wide at apex, always with an anteriorly incised broad band on tergite 3 and a short one on 6, length 8–13 mm, Japan

***lybyensis japonica* Ashmead**

16 Tegulae shining, pronotum postero-laterally not roundly elevated, punctures fine and on abdomen sparser (on tergite 4 intervals partly as large as the points.), basal platform of sternite 2 with apex ending far before middle of the elevated area of the segment, length about 9 mm, Manchuria

***harbinensis* sp. nov.**

– Tegulae dull and opaque, pronotum with postero-lateral areas of upper surface roundly swollen, punctures comparatively larger and stronger (on tergite 4 subreticulate), basal platform of sternite 2 reaching about middle of the elevated area of the segment, length 9–10 mm, Korea and Manchuria

***sabulosa subgibbosa* Yasumatsu, 1935 (*conj. nov.*)**

17 Distal joint of antennae not bent, with apex not truncate, abdomen not regularly banded from tergite 2 apically, tergite 1 without a small ante-apical impression in middle 18

– Distal joint of antennae more or less markedly bent, with apex slightly obliquely truncate, tergite 1 always with a small ante-apical impression in middle 19

18 Abdominal tergites 3 and 6 with a broad whitish band medianly emarginated or incised, legs largely reddish yellow, sternite 6 without postero-lateral spines, length 8–9 mm, Korea, Manchuria, E. Mongolia, N. China, Turkestan

***bicincta* Klug, 1834** (=quadrimaculata Dufour, 1849)

– Abdominal tergite 2 at base in middle, 3 and 6 broadly, 4 and 5 medianly narrowly (or interrupted) maculated whitish or yellowish, legs largely black with yellow maculae, sternite 6 provided with lateral spines, length 8–10 mm, N. China, Turkestan, Central Asia and Europe

***bupresticida* Dufour, 1841**

19 Mid tibiae slightly bent and apical third incrasste (medial lobe of clypeus without tooth at apex in middle, with surface longer than wide and broadly flattened on apical half and provided with a small semitransparent window before apex, inner orbits of eyes distinctly divergent below, distal joint of antennae nearly as long as joint 3 and markedly bent, area dorsalis on propodeum smooth and shining, sternite 6 with apical fringe of long hairs but not in a tuft at sides, large species, 14–18 mm, black and yellow or slightly brownish yellow, fairly varied in colour according to localities, usually abdomen yellow banded, sometimes largely ferruginous yellow), Manchuria, Mongolia, N. China incl. Kansu

***rufipes evecta* Shestakov, 1922 (*conj. nov.*)**

– Mid tibiae not bent nor apically incrassate 20

20 Area dorsalis on propodeum smooth and polished (sternite 6 without latero-posterior tufts of hairs, median lobe of clypeus with a distinct tooth at apex in middle, antennal joint 8 longer than wide) 21

– Area dorsalis striate or rugoso-striate 22

21 Punctuation coarse and dense, on propodeum reticulate, antennal joint 3 slightly less

than as long as 4 (in some state subequal to 2), basal lobe of hind wing more than 1/3 the length of anal cell, abdomen with pale yellow or white bands, langth 8–12 mm, Japan, Korea, Manchuria, N. China, Mongolia, Turkestan, Asia Minor and Europe

albofasciata **(Rossi, 1790)** (=*navitatis* Sm., *luctuosa* Costa)

– Punctuation fine, weak and sparse, on propodeum intervals larger than the points, sometimes with minute points duplicately, antennal joint 3 distinctly longer than 4, basal lobe of hind wing nearly 1/3 the length of anal cell, usually tergites 1–6 yellow-banded, N. China

falcifera **sp. nov.**

22 Sternite 6 on each side at apex with a tuft of hairs 23

– Sternite 6 on each side at apex without a particular tuft of hairs 31

23 Latero-posterior tufts of hairs on sternite 6 with apical portion bundled as if glued together 24

– Latero-posterior tufts of hairs on sternite 6 not bundled at apex 26

24 Antennal joints 7–9 in the narrowest view 1.7 times as long as wide, clypeus seen in profile continued from supra-clypeal area downwards in a straight line, only on apical portion slightly raised, anterior margin with a median tooth not strong, length 10.5 mm, Korea, N. China (Kansu), Turkestan and Europe

ruficornis **(Fabricius, 1793)** (=*cunicularia* Schrank, 1802)

– Antennal joints 7–9 distinctly less than 1.7 times as long as wide, clypeus seen in profile with upper portion more or less roundly raised, apical margin without median tooth (scutellum sparsely punctured, with intervals larger than points) 25

25 Basal lobe of hind wing only slightly less than 1/3 as long as anal cell, antennal joints 6–7 nearly as long as wide, length 8.3 mm, Manchuria

manchuriana **sp. nov.**

– Basal lobe of hind wing nearly 1/4 as long as anal cell, antennal joints 6–7 slightly longer than wide, length 8–9 mm, Korea

hokkanzana **sp. nov.**

26 Tuft of hairs on latero-posterior corners of sternite 6 very dense, curved, with apices directing ventrally (median lobe of clypeus slightly longer than wide — ratio 6/5 —, surface except marginal areas broadly flattened and anteriorly gently raised, not dentate at apex in middle) 27

– Tuft of hairs on latero-posterior corners of sternite 6 rather sparse (about 10 or so in number), with apices directing laterally (clypeus, with the exception of *gegen*, with median lobe much longer than wide — ratio 5/4 —, convex and medianly raised, apical margin dentate in middle) 30

27 Basal lobe of hind wing about 1/5 as long as anal cell 28

– Basal lobe of hind wing about 1/4 as long as anal cell 29

28 Hairs of apical fringe of sternite 7 comparatively long and curved inwards (Fig. 76), propodeum, meso- and metasternum maculated, length 8 mm, N. China

tiendang **sp. nov.**

– Hairs of apical fringe of sternite 7 comparatively short and not curved inwards, propodeum and mesosternum immaculated (metasternum with 2 spots), length 10.5 mm, Korea

***coreensis* sp. nov.**

29 Hairs of apical fringe of sternite 7 comparatively long and slightly directing inwards, length 9 mm, Manchuria

***sungari* sp. nov.**

– Hairs of apical fringe of sternite 7 comparatively short, length about 8 mm, Manchuria Korea and E. Mongolia ***adelpha* Kohl, 1887**

30 Hind legs black, basal lobe of hind wing slightly more than 1/3 as long as anal cell (ratio 3/8), length 11 mm, Korea

***koryo* sp. nov.**

– Hind legs yellow and reddish yellow, basal lobe of hind wing nearly 1/3 as long as anal cell, length 8–12 mm, Korea and Manchuria

***quinquefasciata seoulensis* subsp. nov.**

31 Antennal joint 7 more than 1.5 times as long as wide at apex 32

– Antennal joint 7 less than 1.3 times as long as wide at apex (clypeus convex, medianly broadly raised with apex bluntly tridentate) 33

32 Median lobe of clypeus yellow, convex and medianly raised, without semitransparent window, antennal joint 7 about 1.5 times as long as wide, apical fringe of hairs on sternite 7 long, about 1/3 as long as wide at apex of the segment and curved as in *arenaria* but much sparser (abdomen black, yellow banded, median lobe of clypeus relatively longer than in *arenaria*, punctuation on clypeus and abdomen fine and very sparse), length 10.5 mm

***lacinia* sp. nov.**

– Median lobe of clypeus white or yellowish white, with surface broadly flattened and provided with a semitransparent window before apex, antennal joint 7 about 1.8 times as long as wide, apical fring of hairs of sternite 7 short, less than 1/8 times as long as wide at apex of the segment (abdomen basally yellowish red, apically black, adorned with white band on tergites 2–6, punctuation medium-sized and close), length 9–9.5 mm, E. Mongolia

***gegen* sp. nov.**

33 Front and mid legs (sometimes except trochanters) up to end of femora, and hind legs largely, black, apical fringe of hairs of sternite 7 long but sparse 34

– Legs wholly or largely yellow or reddish yellow, apical fringe of hairs of sternite 7 long and more or less dense 35

34 Punctures on abdomen fine and sparse, (thorax entirely or nearly entirely black, apical joint of antenna distinctly curved, punctures on abdomen with microscopic fine points on interspaces, median lobe of clypeus convex, uniformly scattered with medium-sized distinct punctures, lateral lobes also more or less glossy, the tooth at apex in middle strong and distinct), length 9.5–11 mm, Korea, Manchuria and Europe

***quadrifasciata* (Panzer, 1799)**

– Punctures on abdomen medium-sized and fairly close, length 12 mm, Japan

***eversmanni teranishii* Sato, 1927**

35 Sternite 7 with surface very densely covered with appressed hairs, also with very dense fringe at apex (hairs so dense as if to be woven stuff), punctures on mesonotum and abdomen fine and sparse, propodeum obliquely closely punctate-striate 36

– Sternite 7 with surface not densely covered with appressed hairs, only with apex closely fringed with hairs curved inwards (hairs of fringe and tufts more or less separated) 37

36 Longitudinal furrow on posterior inclination of propodeum very deep, abdomen black with yellow bands, length 11–12 mm, E. Mongolia

***flava* sp. nov.**

– Longitudinal furrow on posterior inclination of propodeum shallow, abdomen basally reddish yellow and tergite 2–6 with yellow or white bands, length 10.5–12 mm, Manchuria and Mongolia

***quadricolor* F. Morawitz, 1889**

37 Apical joint of antenna only slightly curved, punctuation on abdomen fine and very sparse, median lobe of clypeus glossy with sparse punctures medially, lateral lobes dull and opaque, the tooth at apex in middle feeble, yellow bands on tergites 2 and 3 broader than others, length 10.5–11.5 mm, E. Mongolia and Siberia (Minusinsk)

***sibirica* F. Morawitz, 1892**

– Apical joint of antenna distinctly curved, punctuation on abdomen distinct and close, clypeal lobes all similarly somewhat glossy, with punctures not sparse on median area, bands on tergites similar, length 9.5–13 mm, Japan, Korea, S. Manchuria, E. Mongolia, N. China, Turkestan, Central Asia, Europe and N. Africa

***arenaria* (Linné, 1758)** 38

38 Punctuation generally closer, on tergite 4 (except banded area) intervals smaller than points, ground colour of abdomen black, widely distributed over Palaearctic region

***arenaria arenaria* (Linné, 1758)**

– Punctuation generally somewhat finer and sparser, on tergite 4 intervals on an average larger than points, basal two segments of abdomen partly reddish, E. Mongolia

***arenaria apakensis* subsp. nov.**

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II. REVISION OF *CERCERIS* OF JAPAN

Since 1927 when the work of K. Sato on the Japanese species of *Cerceris* appeared no contribution has ever been done in this field. His paper was in Japanese and it has been regretted that the distribution of the knowledge was limited to the Japanese entomologists mainly, although it contained the description of a new species.

Recently I have come to touch with the representatives of the genus in eastern Asia and reviewed the species occurring in Japan on this occasion. The result was that among the seven known species five were required to alter their scientific names at the specific rank to synonymize with the European representatives. It was further made out that two species must be added to the Japanese fauna, one of which was the species already described from Korea and the other a new species. Of the nine species only two are endemic to Japan, one is common to Korea, one is common to Korea, Manchuria and E. Siberia and the remaining five which are the widely distributed Palaearctic species involve two subspecies endemic to this country.

Synoptic Key to the Species of *Cerceris* in Japan

1 Maculae on abdomen restricted to certain segments, dissimilar, legs black and yellow, sternite 2 with either platform at base or two tubercles before middle, 1st tergite without a small impression at apex in middle 2

– Greater part of abdominal segments maculated, maculae regular and similar, legs yellow or reddish yellow, sternite 2 without platform nor tubercles, 1st tergite with a small impression at apex in middle 11

2 First abdominal segment seen from above longer than wide 3

– First abdominal segment seen from above (with anterior inclination held vertical) broader than long 6

3 Clypeus with appendix, antennae 12-jointed, abdomen with 6 visible segments (♀) (at least a large macula along inner orbit of eye and a distinct band on tergite 3 yellow, fore wing with radial cell and its apical portion darkened) 4

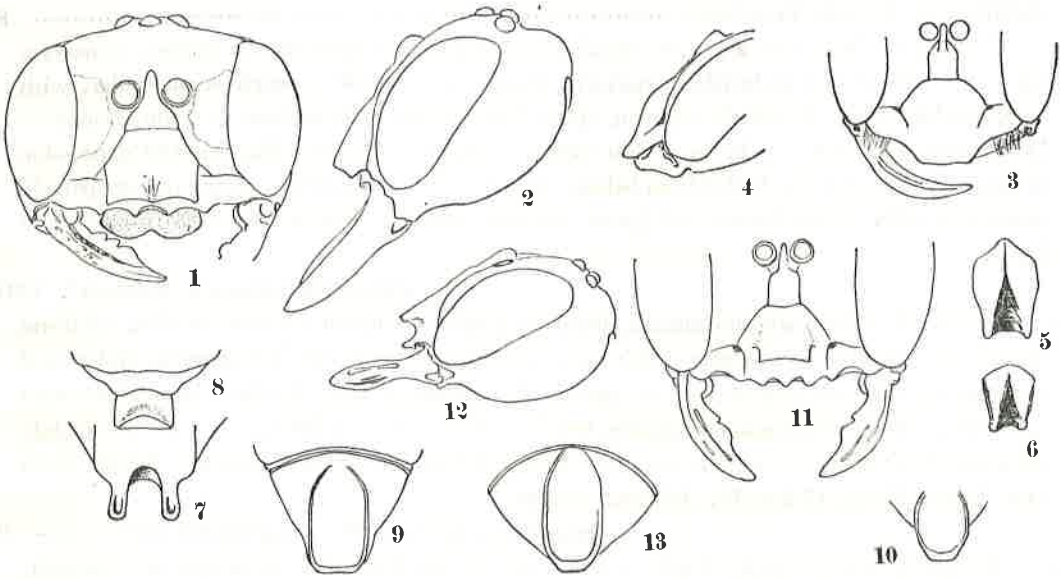
– Clypeus without appendix, antennae 13-jointed, abdomen with 7 visible segments (♂) (tergite 3 with a distinct band, fore wing clouded as in ♀) 5

4 Appendix of clypeus broad, medianly carinate, with apex bluntly tridentate (Fig. 1), apical margin of the ground part of clypeus quadridentate (area cordata on propodeum more or less longitudinally rugoso-punctate, platform of sternite 2 nearly semicircular, medially at apex carinate, pygidial area with lateral magrins nearly parallel (Fig. 9), length 9.5–12.0 mm, Hokkaido, Honshu and Tsushima

***nipponensis* sp. nov.**, ♀

– Appendix of clypeus narrow, medianly not carinate, with apex gently emarginate and apical portion slightly raised (Fig. 11), apical margin of the ground part of clypeus distinctly quinquedentate (area cordata feebly and rather sparsely punctate, sometimes on marginal areas transversely rugoso-punctate, platform of sternite 2 neary rectangular, not distinctly outlined and medianly at apex carinate, pygidial area slightly roundly convergent towards apex (Fig. 13), length 8–10 mm, Hokkaido and Honshu

***carinalis* Pérez, 1905** ♀



Figs. 1–13. 1–10 : *Cerceris nipponensis* sp. nov. (1, 2, 5, 7, 9, ♀; 3, 4, 6, 8, 10, ♂; 5, 6, metasternum; 7, 8, apical abdominal sternite; 9, 10, pygidial area). 11–13 : *Cerceris carinalis* Pérez.

5 Curvature of clypeus in the lateral view highest at above middle, antennal scape black (sometimes with a yellow spot), hind metatarsi with a spine on outer margin (sometimes dropped off) (usually clypeus black, sometimes with a macula or maculae, generally less rich in maculation), length 7–9 mm, Hokkaido, Honshu and Tsushima

***nipponensis* sp. nov.**, ♂

– Curvature of clypeus in the lateral view highest towards middle, antennal scape broadly yellow, hind metatarsi without a spine on outer margin (usually with 3 large maculae on clypeus, sometimes lacking the median or lateral ones, generally more brightly maculated than in *nipponensis*), length 7–8 mm, Hokkaido and Honshu

***carinalis* Pérez, 1905**, ♂

6 ♀ (Antennae 12-jointed, abdomen with 6 visible segments) 7

– ♂ (Antennae 13-jointed, abdomen with 7 visible segments) 10

7 Clypeus (Fig. 16) with lamellate appendix liberating just before apex, with apex deeply roundly incised, sinus of the incision nearly in contact with the ground part of the clypeus, the surface broadly depressed, with basal portion medianly carinate and provided with a small conical tubercle, antennal joint 3 more than 2.5 times as long as wide at apex (fore wing with anterior apical half markedly darkened, face below antennae, tergite 3 nearly wholly, 5 apically orange yellow, mandibles bluntly bidentate on inner margin, area dorsalis obliquely finely striate, pygidial area : Fig. 17), length 13–15 mm, Kyushu and Korea

***sobo* Yasumatsu et Okabe, 1936**

– Clypeus without lamellate appendix, basal portion of median lobe swollen and apical portion impressed with apex truncate, antennal joint 3 at most twice as long as wide at apex,

sternite 2 with platform at base 8

8 Tergite 2 at base with a yellow macula consisting of two spots fused together, transverse band on tergite 3 with an incision anteriorly, platform on sternite 2 nearly semicircular, with apex reaching about 2/5 of the segment (joint 3 of antenna twice as long as wide at apex — in the narrowest view —, in the widest view 1.7 times as long as wide, anterior depression of clypeus occupying nearly 2/3 from below, area dorsalis mainly finely coriaceous or sparsely punctured with lateral furrows obliquely strorgly crenate), length 13–16 mm, throughout Japan

***rybyensis japonica* Ashmead, 1904**

– Tergite 2 at base without macula, band on tergite 3 without anterior incision, platform on sternite 2 nearly rectangular, with apex reaching about 1/4 of the segment (joint 3 of antenna 1.8 times as long as wide at apex in the narrowest view, in the widest view about 1.5 times, anterior depression of clypeus reaching about 3/4 from below, area dorsalis mainly transversely or obliquely weakly punctate-striate with lateral furrows crenate), length 12–15 mm, Japan, Korea, China, W. Asia and Europe

***hortivaga* Kohl, 1880** (=*harmandi* auctt.) 9

9 Tergite 2 wholly black, 5 with a short narrow band apically, pronotum immaculated, median lobe of clypeus with apex nearly truncate, wings hyaline, apically clouded

***hortivaga* Kohl** (*s. str.* and the usual form of Japan)

– Tergite 2 on posterior half orange yellow, 5 with a large macula consisting of two rounded ones fused, pronotum carrying two large lateral maculae, median lobe of clypeus with apex sinuate (sides produced), wings fuscous, anteriorly and apically more strongly so, Ryukyu

***hortivaga amamiensis* subsp. nov.**

10 Antennal joint 3 more than 2.3 times as long as wide at apex, joints towards middle longer than wide, inner margins of eyes nearly parallel as far below as lateral bases of clypeus, platform of sternite 2 present but not well outlined posteriorly, tergite 1 with apical lamellate fringe not standing vertically (face below antennae except apical margin of clypeus, wing tegulae, tergite 3 nearly wholly, small flecks on 5 and 6, greater part of front and mid legs except femora and mid and hind trochanters yellow, yellow on face reaching upwards above sockets of antennae on both sides), length 10 mm, Kyushu and Korea

***sobo* Yasumatsu et Okabe, 1936**

– Antennal joint 3 less than twice as long as wide at apex, joints towards middle as long as wide or wider than long, inner margins of eyes distinctly divergent below, platform of sternite 2 well margined posteriorly, tergite 1 with apical lamellate fringe standing vertically 11

11 Tergite 2 with 2 spots at base in middle, band on tergite 3 medianly deeply incised from in front, scape of antenna beneath broadly yellow, platform on sternite 2 with apex rounded and reaching about 1/3 of the segment (median lobe of clypeus less strongly convex and highest at about 2/3 from below (Fig. 14), usually facial macula reaching above bases of antennae, tibiae of legs yellow with inner side only dark brown), length 9–12 mm, througout Japan

***rybyensis japonica* Ashmead, 1904**

– Tergite 2 without maculae, band on tergite 3 anteriorly not incised (sometimes attenuate

medianly), scape of antenna usually wholly black (rarely with a small spot), platform on sternite 2 with apex nearly straight, and reaching only about 1/4 of the segment (median lobe of clypeus more strongly convex and highest at about 3/4 from below (Fig. 15), usually facial macula not reaching above sockets of antennae, tibiae of legs yellow in front only), length 7.5–11 mm, Japan, Korea, China, W. Asia and Europe

***hortivaga* Kohl, 1880** (=*harmandi* auctt.)

11 ♀ (Antennae 12-jointed, abdomen with 6 visible segments) 12

– ♂ (Antennae 13-jointed, abdomen with 7 visible segments) 15

12 Clypeus without appendix, flattened and apically raised, apex narrowly bilobate and provided with a small tooth on each side, (Fig. 18) area dorsalis smooth and polished, pygidial area : Fig. 19. (two lateral maculae on face, a spot behind eye, 2 spots on pronotum, tegulae, regular maculae on tergites 2–5 white, legs yellowish red, clypeus coarsely, somewhat rugosely punctured), length 12–13 mm, Japan, Korea, Manchuria, E. Mongolia, N. China, Turkestan and Europe

***albofasciata* (Rossi, 1790)** (=*navitatis* Smith, 1873)

– Clypeus with an appendix, sometimes as a subrectangular pre-apical lamella, sometimes as a stout projection near its base, area dorsalis of propodeum simply striate or rugoso-striate, pygidial area with sides not confluent at base 13

13 Clypeus with an ante-apical lamella, subrectangular or subsemicircular, always wider than long and raised at apex (Fig. 20), anterior margin of ground part of clypeus with a short tooth in middle, pygidial area : Fig. 21 (usually 3 maculae on clypeus, a large macula on each side of face, a spot behind eye, two spots on pronotum, tegulae, postscutellum, 2 large maculae on propodeum and on tergite 1, a medianly attenuate band on posterior margin of tergites 2–5 yellow, legs with apical portion of femora, whole tibiae, fore tarsi, mid and hind basitarsi reddish yellow), length 12–15 mm, Hokkaido, Honshu, Korea, N. China, Manchuria, Mongolia, Turkestan, Central Asia, Cyprus, Europe and N. Africa

***arenaria* (Linné, 1758)** (=*quinquecincta* Ashmead, 1904, nec Fabricius, 1787)

– Clypeus with appendix situated above at base, thick and stout 14

14 Clypeal appendix projecting at an angle of about 60° with the surface, nearly twice as broad as long, deeply roundly emarginate at apex (Fig. 22), apical margin of ground part nearly straight in middle, with on each side a short srong carina slightly protruding into a tooth, pygidial area : Fig. 23 (coloration similar to *arenaria*, with legs except coxae wholly ferruginous), length 17 mm, Honshu (Chichibu), Korea, Manchuria and E. Siberia

***pedetes* Kohl, 1887**

– Clypeal appendix projecting vertical to the surface (Fig. 24), in the dorsal view conical with apex rounded (sometimes minutely incised) and on apical portion medianly feebly carinate, beneath flattened and polished, apical margin of ground part with two short teeth on each side and two blunt tubercles toward middle, pygidial area : Fig. 25 (2 spots on face, postscutellum, a medianly attenuate band on posterior margin of tergites 2–4 yellow, legs black with inside of front tibiae and front tarsi ferruginous), length 10–12 mm, Honshu (Iwate Pref.)

***eversmanni teranishii* Sato, 1927**

15 Area dorsalis of propodeum smooth and polished, basal lobe of hind wing nearly half as

long as anal cell (legs yellow partly ferruginous, marginal bands on abdominal tergites 2–4 usually interruped narrowly in middle, antennal joint 3 about 1.5 times as long as wide at apex, median lobe of clypeus gently convex and bluntly tridentate at apex), length 8–11 mm, Honshu, Korea and widely distributed over the Palaearctic region

***albofasciata* (Rossi, 1790)** (=*navitatis* Smith)

– Area dorsalis of propodeum striate, basal lobe of hind wing at most 1/3 as long as anal cell (median joints of antennae 1.3–1.5 times as long as wide, without tuft of hairs on each side of sternite 6) 16

16 Sternite 7 with posterior fringe of hairs not well developed, maculae whitish (flagellum of antennae nearly completely black), length 8–10 mm, Honshu (Iwate Pref.)

***eversmanni teranishii* Sato, 1927**

– Sternite 7 with posterior fringe of long hairs which are curved inwards, maculae of body yellow (median lobe of clypeus longitudinally roundly raised, with apex bluntly tridentate, median tooth distinct, end joint of antenna strikingly curved, face except around sockets of antenna, clypeus except apical margin, sometimes a spot behind eye, 2 spots on pronotum, tegulae, postscutellum, 2 spots on tergite 1, apical band on tergites 2–6 yellow, legs black and yellow, length 10–13 mm, Japan, Korea Manchuria, Mongolia, China W. Asia, Europe

***arenaria* (Linné, 1758)**

(Remarks. *Cerceris pedetes* Kohl ♂ is still undiscovered)

Synonymy of five species hitherto known

In the following the references are mainly confined to those relating to the Japanese specimens.

1) *Cerceris navitatis* Smith, 1873

This is a synonym of *C. albofasciata* (Rossi, 1790) (=*luctuosa* Costa) (*syn. nov.*)

Cerceris navitatis Smith, Trans. Ent. Soc. Lond., p. 195, 1873; —— Strand, Arch. Naturg., A, 1913. S. 160; —— Sato, Kontyu, 2 (3), p. 93, 97, 98, 1927; —— Katayama, Trans, Kansai Ent. Soc. 4, p. 38, 1933 (Biol.); —— Tsuneki, Jour. Nat. Hist. Soc. Tokyo, 35, p. 186, 1937 (Biol.)

Remarks. Comparative studies with the European and East-Asiatic specimens proved that there is no difference of characters worthy of mention among them.

2) *Cerceris quinquecincta* Ashmead, 1904 (nec Fabricius, 1787)

This is doubtlessly a synonym of *C. arenaria* (Linné, 1758) known widely in the Palaearctic region (*syn. nov.*).

Cerceris quinquecincta Ashmead, Jour. New York Ent. Soc., 12 (2), p. 66, 1904; —— Sato, loc. cit., p. 97, 98, 1927; —— Hamatake et al., Kontyu, 5 (4), p. 189, 1930 (Biol.); —— Yano, Icon. Ins. Jap., Ed. 1, p. 277, 1932; Ibid., Ed. 2, p. 1469, 1950; —— Tsuneki, loc. cit., p. 186, 1933 (Biol.)

Cerceris navitatis Yano (nec Smith), Konchu-zasshi, 1, p. 21, 1915.

Remarks. The original description was made basing on a single male specimen and only the colour pattern was dealt with. Lack of the allied species in Japan makes it possible to identify it. The close affinity between *quinquecincta* and *arenaria* was already suggested by Sato in his early work. Direct comparison of the examples of both species made it clear that they belong to one and the same species. In general the Japanese and Korean specimens seem to be somewhat large in size and less bright in maculation (maculae smaller, bands narrower and in males the propodeum

always lacking maculae, legs more broadly black). But no important structural nor sculptural differences could be discovered. In our specimens also, as in those of Europe, a fairly marked variation in the form of the anterior lamellate portion of the clypeus is observed. It is sometimes semicircular, sometimes rectangular, but such a variation has no bearing upon the localities of the specimens.

Nomenclatorially *C. quinquecincta* is preoccupied by *C. quinquecincta* (Fabr., 1787). But now such a discussion has become unnecessary.

3) *Cerceris teranishii* Sato, 1927

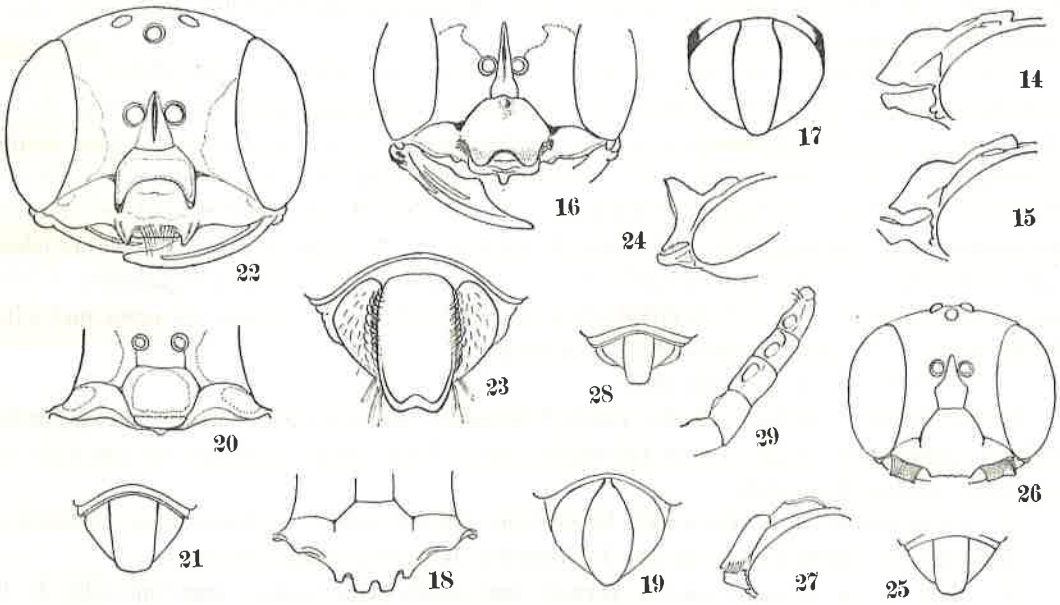
This is considered a geographical race of the European species, *C. eversmanni* Schulz, 1912. Hence it should be called *C. eversmanni teranishii* Sato (*conj. nov.*).

Cerceris cornuta Eversmann (nec Fabr.), Bull. Soc. Imp. Nat. Mosc., 22, p. 406, 1849; —— Schletterer, 1878, p. 436.

Cerciris eversmanni Schulz, Berliner Ent. Zeitschr., 57, p. 91, 1912; —— Beaumont, Ann. Soc. Ent. France, 114, p. 67, 1950.

Cerciris teranishii Sato, loc. cit., p. 91, 1927; —— Yasumatsu, Ins. Jap. Ill. Icon., p. 373, 1939.

In the form of the vertically standing process on the upper region of the clypeus of the female this species seems to show a fair degree of variation. This is already described upon the specimens from Europe by de Beaumont (1950 a). In the Japanese specimens the under surface of the process is flattened and polished, meeting with the convexed dorsal surface at an acute angle in the lateral view (Fig. 24), not truncate at the apex. In the dorsal view it is markedly attenuate towards the apex which is rounded and usually feebly emarginate or incised in the middle. The surface is



Figs. 14–29. 14 : *Cerceris lybyensis japonica* Ashmead, ♂, head in profile. 15 : *C. hortivaga* Kohl, ♂, ibid. 16–17 : *C. sobo* Yas. et Ok., ♀. 18–19 : *C. albofasciata* Rossi (clypeus and pygidial area). 20.21 : *C. arenaria* L., ♀ (ibid.). 22–23 : *C. pedetes* Kohl, ♀. 24–29 : *C. eversmanni teranishii* Sato (24–25, ♀; 26–29, ♂).

coarsely punctured and medianly gently carinated just as was given in the original description of Eversmann. The Japanese specimens have also a character in the form of the pygidial area. It is gently roundly convergent towards the apex which is broadly rounded. This state is closer to the description of Beaumont on the French specimens, but differs from the Eversmann's original description which is "fast dreieckig". Moreover, our specimens are generally darker in colour and the legs are broadly black. The male of the Japanese representative differs from the nominate race in the following points : (1) Median lobe of clypeus (Fig. 26) more highly elevated. Especially on the upper portion it is sudenly raised, with the disc nearly flattened and slightly raised on apical portion (Fig. 27). (2) The form of the pygidial area (Fig. 28) slightly different, not enlarged near apex. (3) Punctures generally coarser, on propodeum somewhat sparse, but with intervals smaller than punctures, on tergite 4 intervals also smaller than points. (4) Legs more broadly black (antennae nearly wholly black as in the nominate race). Other characters well agree with those of the type species. Upon such differences of characters *teranishii* was allocated as a subspecies of *eversmanni*.

4) *Cerceris harmandi* Pérez 1905 and *C. harmandi* auctt.

Cerceris harmandi Pérez is considered a synonym of *C. japonica* Ashmead (*syn. nov.*) and the species known among the Japanese entomologists as *harmandi* must be a synonym of *C. hortivaga* Kohl, 1880. (*syn. nov.*).

It is quite doubtful that the commonest species of *Cerceris* in Japan known as *C. harmandi* among the Japanese authors is in reality identical with the true *harmandi* Pérez, because the original description of the female coincides partly with the charcters of the so-called *harmandi* and partly with those of *japonica* Ashmead. After the careful comparison I arrived at the above described conclusion.

Among the characters described by Pérez eight useful ones remain, provided those common to both the species are removed. These are colour of the prothorax, postscutellum, hind tibiae, hind metatarsi and the 5th abdominal tergite, punctuation on the 5th tergite and the form of the platform of the 2nd sternite and of the pygidial area. Of these the colour of the prothorax and postscutellum and the punctuation of the 5th tergite coincide with the characters of the so-called *harmandi*, while the remainder with those of *japonica*. If the cases of rare variation are taken into consideration the characters assigned to the so-called *harmandi* occur also in *japonica*. While among the characters assigned to *japonica* those considered most important are never met with in the other. I will mention about these in some detail.

1) Le prothorax entièrement noir.

In the Japanese specimens of the so-called *harmandi* the pronotum is almost always black, while in *japonica* it carries usually two yellow spots. Very rarely, however, we can find the specimens lacking the maculae.

2) Le 5e segment orné d'une large bande jaune dorsale, formée de deux ovales confluentes.

This state is almost always the case in *japonica*, but not in *harmandi* auctt.

3) Base du 2e segment ventral portant une saillie semi-lunaire, rappelant celle de la *Rybyensis*.

This is decidedly a character of *japonica*. The platform of *harmandi* auctt. is rather transversely rectangular, with the apical margin nearly straight.

4) Épipygium en ovale allongée, tronqué au bout, mat et finement grenu.

This agrees completely with the character of *japonica*. In *harmandi* auctt. the apex of the area is rounded.

He did not mention as to the yellow maculae on the 3rd abdominal segment, only describing that très voisine de l'*unifasciata* Sm. du Nord de la Chine, which has a broad band on the 3rd abdominal tergite. He did not also allude to the maculae on the 2nd tergite which is useful in discriminating the two species in question. His description on the maculae of the legs seems rather better agreeing with those of *japonica*.

Judging from the above accunts the female of *harmandi* Pérez, 1905 must be a slightly deviating specimen of *C. japonica* Ashmead, 1904.

On the other hand, his description of the male well agrees with the characters of that of the so-called *harmandi*. There is no question, however, as to the nomenclature, since it is preoccupied by *japonica*. With regard to *japonica* itself there is also a problem, of which mention will be made elsewhere.

Here I must take up the problem concerning the so-called *harmandi* of the Japanese entomologists. It is not, however, an undescribed species. Its characters nearly completely agree with those of *C. hortivaga* Kohl, 1880, known from Europe, North China and Korea. The Korean as well as the Chinese specimens are considerably varied in macuation, while those captured in Japan are fairly uniform in this respect, rather closer to those of Europe. It may be due to the convergence of characters, secondarily taken place.

Table 2. Differences of main tendencies of characters in *Cerceris rybyensis japonica* and *C. hortivaga* (=*harmandi* auctt.) in ♀♀.

Character	*rybyensis japonica*	*hortivaga*
Antennal joint 3 (Length : width at apex)	Narrowest view ··· 1.9–2.1 Broadest view ··· 1.6–1.8	Narrowest view ··· 1.8–1.9 Broadest view ··· 1.5
Impression of median lobe of clypeus	Mostly up to 2/3 from apical margin	Mostly up to 3/4 from apical margin
Platform on abdominal tergite 2	Semicircular or subtriangular, apex reaching about 2/5 of the incrassate portion of the segment	Transversely rectangular (apex slightly rounded), apex reaching about 1/3 of the incrassate portion of the segmeot
Maculae on abdomen	Tergite 2 at base always maculated, 5 with a large macula consisting of two rounded maculae fused together	Tergite 2 at base immaculated*, 5 with a short transverse band
Colour of legs	Front and mid tibiae yellow, hind tibiae with a black spot posteriorly towards apex	Front and mid tibiae posteriorly black, hind tibiae also posteriorly wholly black
Pygidial area	Apical margin more or less broad	Apical margin narrower than in *japonica*
Striation of area cordata	Main direction of running oblique or longitudinal (Mostly with coarse striae on periferal regions)	Main direction of running transverse (Mostl y weakly striate or punctate)

* In the Korean specimens the character is quite different.

5) ***Cerceris japonica* Ashmead, 1904**

Cerceris japonica was originally described on the basis of a female. The description concerned the colour pattern only. Fortunately, however, the species can be well identified. It is separable from *harmandi* auctt. (nec Pérez ♀) not only by the difference of maculation, but also by the difference in structure of the clypeus, the antennae (relative length of the joints) and in the form of the platform at the base of the 2nd sternite and the pygidial area. Also they are different in the main type of sculpture of the area cordata on the propodeum (Table 2).

However, of the characters of *japonica* the important ones well conincide with those of *rybyensis* Linné, *e.g.* the form and the structure of the clypeus, relative length of the antennal joints, structure of the propodeum, the platform of the 2nd sternite, the relative length of the basal lobe of the hind wing, the sculpture of the area cordata including variation and the general coloration. The chief difference is that the punctuation of *japonica* is much coarser than in *rybyensis*. Further differences are that the pygidial area in the female is slightly wider and the 6th sternite is slightly more broadly excavated. Such differences are considered not sufficient to separate the two as distinct respectively. Hence *japonica* was allocated as a subspecies of *rybyensis*.

A new subspecies of *C. hortivaga* from the Ryukyus

***Cerceris hortivaga amamiensis* subsp. nov.**

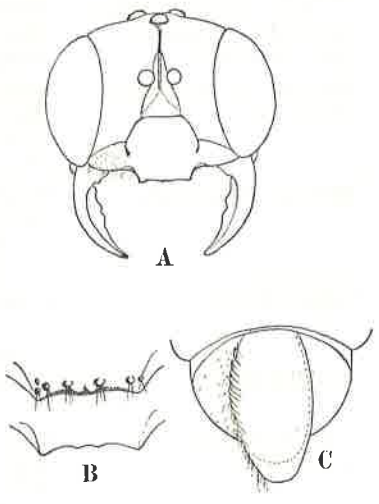
This subspecies differs from the original race in the dark clouded wings, the brighter coloration, slightly in the form of the anterior margin of the clypeus and also somewhat in punctuation

♀. Coloration: Black, clypeus except apical margin, lower half of face except around antennal sockets, supraclypeal area, a touch on interantennal carina, a broad streak on basal half externally of mandibles lemon yellow, with upper margin of the facial maculae somewhat darkened into orange; a large macula beneath antennal scapes, two large lateral maculae on pronotum, teguale except inner area and a central transparent circlet, postscutellum, apical broad bands on tergite 2 (medianly in front slightly incised,) 3 (occupying nearly whole the segment) and 5 (medianly broadly emarginate in front), legs except coxae, trochanters, base of front and mid femora, inner margin of hind femora, a spot on inner face of hind iibiae and apical four segments of hind tarsi orange yellow, partly somewhat brownish. Wings darkened throughout, especially strongly so on anterior and distal portion of fore- and apex of hind-wings.

The structure of head seen in front (Fig. A) as in the nominate race, excepting apical margin which is sinuate with sides distinctly produced (Fig. B), structure of antennal joints including relative length, of platform on sternite 2 and of pygidial area (Fig. C) as in the original form.

Punctures on vertex similar excepting that post-ocellar area transversely broadly impunctate; contrast between the glossy (with sparse punctures) median lobe of clypeus against the finely punctate and dull lateral lobes more striking; punctuation on propodeum sparser. Length 12.3 mm. ♂ unknown.

Holotype: ♀, Nishinakama, the Island of Amami-Oshima, 26. Ⅵ. 1961, K. Tsuneki leg.



Figs. A, B, C: *Cerceris hortivaga amamiensis* subsp. nov., ♀.

Notes on *Cerceris sobo* Yasumatsu et Okabe, 1936

This species is very interesting in that it shows an intermediate postition between the groups of *rybyensis* and *arenaria* in the morphological characters. At the same time the species gives us an instance that the change in morphological and biological characters does not always occur in parallel with each other in evolution.

In this species the platform at the base of the 2nd sternite of the abdomen is represented by two small tubercles in females and the clypeus of the sex is approximate to the state of *arenaria* in having the bilobate ante-apical lamellate appendix (Fig. 16). Biologically this species belongs to the group of the weevil-hunters. In my collection obtained in Korea there is a specimen which was pinned with a weevil that was carried by the wasp at the time of collecting.

There is no record of capture of the male of this species in Japan. I found it in the collection of Dr. Takeuchi, which was captured in Korea, and gave the description in connection with the *Cerceris* of that peninsula.

Cerceris nipponensis sp. nov. and its relation to *C. carinalis* Pérez

Cerceris nipponensis sp. nov.

This species belongs to the group of *rubida*, though different in the sculpture of the area cordata, and is very close to *C. carinalis* Pérez, 1905, from which, however, the female is easily separable by the character of the clypeus. But the separation in the male is very difficult.

♀. Length 9.5–12.0 mm. Black. A spot at base in front of mandibles, a comparatively large oval marking along inner orbits of eyes, a band occupying the posterior half of abdominal tergite 3, a line on the posterior magin of 5 (sometimes only in middle), front and mid tibiae in front, a spot on hind trochanters and rarely a spot on wingtegulae orange yellow. Mandibles apically glossy brown; antennae beneath ferruginous; tarsi of legs dark brown, beneath paler. Wings hyaline, apically somewhat fuscous, radial cell of fore wing and its external area dark brown, veins brown.

Head seen from above with OOD : POD : OCD = 16 : 10 : 17 (≒ 3 : 2 : 3), seen in front (somewhat from beneath) : Fig. 1, clypeus with stout appendix liberated only at apical portion which is broader than long, medianly carinated apically, with apex bluntly tridentate. Ground portion of clypeus with quadridentate apex, labrum and mandible : Fig. 1, interantennal carina acute and high, rounded above in the lateral view. Antennal joint 3 thrice as long as wide at apex, joints in the middle portion longer than wide (ratio 1 : 1.3). Head seen in profile : Fig. 2. On thorax mesopleuron without process on lower portion, metasternum : Fig. 5. dorsal area of propodeum medianly finely grooved; abdominal segment 1 usually distinctly (sometimes only slightly, but always more or less) longer than wide with apex broadly lamellate, impunctate and brown in colour, but not raised as in *hortivaga* or *rybyensis japonica* of Japan; apices of segments 2, 3 and 4 narrowly raised slightly, 2nd sternite at base with nearly semicircular platform, usually distinct on posterior outline and medianly raised towards apex. Pygidial area : Fig. 9, apical half with lateral margins usually parallel, only occasionally very slightly convergent towards apex, 6th sternite : Fig. 7. Wing venation normal. Hind metatarsi provided with a spiniform hair towards middle. Basal lobe of hind wing 1/4 as long as anal cell.

Vertex coarsely punctured, with 3 impunctate small areas just behind ocellar region; upper front somewhat finely and closely ruguloso-reticulate, clypeus scattered sparsely with gross punctures and with fine punctules between. Punctures on pro- and mesonotum coarse, close and partly confluent longitudinally, with intervals smaller than points; propodeum coarsely reticulately punctate, area dorsalis most usually obliquely striate and punctate, striae sometimes strong and sometimes obsolate, in the latter case the area

comes to be merely closely punctured. Abdominal tergites strongly closely punctured with medium-sized punctures, on tergite 4 intervals on an average as large as the points, sternites with sparse fine punctures on posterior portion of each segment.

♂ Length 7.0–9.2 mm. Black. Orange yellow : An elongate semielliptic marking on inner orbit of eye, interantennal carina, a spot beneath antennal scape (sometimes lacking), posterior half of 3rd abdominal tergite, hind margin of 5th and 6th narrowly, tibiae and metatarsi of front and mid legs in front, hind trochanters, sometimes also a spot on mid trochanters. Antennae beneath, rest of front and mid tarsi ferruginous, wing veins, rest of front and mid tibiae, hind tarsi and posterior membraneous areas of abdominal tergites 1–6 brown to dark brown. In some bright coloured specimens (rare) a spot varying in size on upper portion of median lobe of clypeus and very rarely a spot on lateral lobes also yellow. Clouding of fore wings as in female.

Clypeus : Fig. 3, seen in profile : Fig. 4, antennal joint 3 nearly twice as long as wide at apex, sternite of metathorax : Fig. 6, abdominal segment 1 comparativiely longer than in ♀, but considerably varied in relative length to width, but always longer than wide, posterior margins of segments as in ♀, sternite 2 with basal platform distinctly raised, mostly pentagonal, half as long in middle as the raised area of the segment, pygidial area : Fig. 10, ventral plates 6 and 7 : Fig. 8. Vertex and upper front coarsely punctured, with intervallic space slightly smaller than punctures, clypeus with duplicate punctures, sparse and larger ones and close and minute ones, on mesonotum space wider than points except marginal areas, punctures sometimes longitudinally confluent, propodeum punctate-reticulate, obliquely rugoso-punctate, on area cordata rather finely and sparsely punctured, partly obliquely rugose, on tergites 3 and 4 intervals wider than points which are coarse.

Holotype : ♀, Mt. Haku, Japan, 15. Ⅷ. 1957, K. Tsuneki leg.

Allotype : ♂, Sounkyo, Hokkaido, 1. Ⅷ. 1952, K. Tsuneki leg.

Paratypes : 1 ♀, Sounkyo, 28. Ⅵ. 1958; 3 ♀♀ 8 ♂♂, Jozankei, 1. Ⅷ–22. Ⅸ. 1945–51; 2 ♀♀ Narukawa, Hakodate, 8–9. Ⅷ. 1958; 1 ♀, Sapporo, 2. Ⅸ. 1945; 3 ♀♀ 13 ♂♂, Mt. Haku, 15–31. Ⅷ. 1954–59; 1 ♀, Nikko, 12. Ⅷ. 1955; 2 ♀♀ 5 ♂♂, Koike, Fukui Pref., 31. Ⅵ.–3. Ⅸ. 1954–59. All leg. K. Tsuneki.

Other specimens : 1 ♀ (25. Ⅷ. 1956) 1 ♂ (9. Ⅵ. 1941), Tsushima, T. Shirôzu leg.; 10 ♂♂, Jozankei, 1 ♂, Sounkyo; 21 ♂♂, Mt. Haku; 3 ♂♂, Koike; 1 ♂, Ikarigaseki, Aomori Pref., 31. Ⅷ. 1954 (M. Yamada).

Relationship to C. carinalis *Pérez.* As above atated this species is easily distinguished from the allied species, *C. carinalis* Pérez, in females, but very difficult in males. I can not classify as yet with confidence every specimen of the males into either of the two species. First I tried to find the distinguishing clues by comparing the corresponding parts of the body, by the characters of which the females are easily separable from each other. They are different not only in the structure of the clypeus (*cf.* Fig. 11), but also in the characters of the mandible (Figs. 1 and 11) and the pygidial area (Figs. 9 and 10). But the characters of the corresponding parts of the body in the male could not definitely be of use for the separation of the two species. The specimens before me which must have included both the species had the clypeus of the similar structure. I attempted to find any difference in the state of its surface swelling and its apical condition. These showed indeed a certain degree of variation, but it was not the variation that could clearly be separated into two classes. The mandible was all simple and similar, and the pygidial area was also nearly uniform in all.

The females of the two species can also be distinguished by the coloration of the body and the legs, and by the main tendency of the sculpture of the area dorsalis. In *nipponensis* (♀) the

antennal scape beneath is always black, while in *carinalis* the area is always coloured yellow. The clypeus of *nipponensis* is always black, while that of *carinalis* usually carries three maculae, one on the median lobe and one on each side. Of the 14 examples of *carinalis* studied only a single female has the clypeus wholly immaculated and two have the median lobe immaculated but with the lateral lobes carrying small maculae. Still further, the thorax of *nipponensis* ♀, with the exception of the wingtegulae, is always black, while in *carinalis* sometimes the metathorax and two spots on the propodeum are yellow. On the legs *carinalis* has the tarsi of all legs coloured yellow in front, in *nipponensis* the portions are brown or dark brown.

However, none of such differences in maculation could be a final point of determination of the species in males. For instance, in some of the specimens one of the scapes is maculated and the other immaculated, in some cases the maculae are very fine and faint. Thus we could not draw a line between the maculated and the immaculated. A similar relation is also true as to the clypeus.

Generally the sculpture of the area dorsalis in *nipponensis* (♀) is obliquely punctate-striate and in *carinalis* (♀) rather finely and sparsely punctured. If in the latter species any striation is defined (on the periferal region in the main) the direction of its running is rather transverse. The difference is considerably distinct in females. But this character is also quite useless when applied to the males, because (1) it is difficult in many cases to separate the two types definitely, and (2) the groups thus classified have no acceptable connection with the groups classified by other characters such as coloration, curvature of the clypeus seen in profile and some others given below. Similarly the characters of the platform of the 2nd sternite are completely helpless.

I then examined the locality data of the female specimens and found a seemingly effective clue :

(1) From Jozankei and Sapporo 7 females of *nipponensis* were captured, but none of *carinalis*.
(2) From Iwama at the foot of Mt. Haku, several females of *carinalis* were collected, but none of *nipponensis*.

If these distributional data are truely reliable the males captured in Jozankei and Sapporo must be the males of *nipponensis* alone, while those of Iwama the males of *carinalis*. The first fact was considered fairly dependable, since in Hokkaido only a single female of *carinalis* had been captured from Hakodate, the southernmost region of Hokkaido and far apart from the localities above listed, and moreover, my specimens were the results of repeated and exhausting wasps collecting, letting none of the related forms that came in sight escape. On the other hand, the second faet seemed less reliable, because from the areas adjacent to the locality the females of *nipponensis* had been not unfrequently captured.

I, therefore, examined carefully the 20 male specimens captured in Jozankei. All but one had the immaculate clypeus and all but two showed no marking on the scape of the antennae. In this case, however, the presence of the exceptional ones is decisive in showing that *nipponensis* ♂ can be maculated on the clypeus and beneath the antennal scape. I also examined a male from Sounkyo, situated in the central region of Hokkaido. It had also a small yellow spot beneath the scape. On the other hand, however, the result above mentioned seemed to suggest that the male specimens without maculae on the clypeus and the antennal scape had a high possibility that they were the males of *nipponensis*. As to the sculpture on the triangle of the propodeum, however, they were markedly varied and could not afford any useful clue in determining the species.

I must mention here that one of the exceptional male from Jozankei was very *carinalis*-like. The scape beneath was wholly yellow and the clypeus had a small yellow macula on each of the lateral lobes. Moreover, it showed a small yellow spot on each side of the 2nd sternite of the abdomen. The curvature of the clypeus seen in profile was highest towards the middle (in *nipponensis* ♀ usually above the middle) and the area cordata of the propodeum was merely finely and sparsely punctured. These characters were so different from those of others that it seemed that the specimen might be a male of *carinalis* and that this species also occurred in Jozankei. I therefore put aside it in my consideration as a particular specimen rather than as an exception of *nipponensis*.

Such being the case I again examined the female specimens of both the species with much more care, measuring proportions of every apparently possible part. Measuring was all in vain. I tried to examine the genitalia, but could not obtain any helpful clue to the classification, since the organ, as pointed out by de Beaumont, was not well chitinized and the examples taken out of the dried insects could not be of use for the morphological investigation. But I finally could find that all the female specimens of *nipponensis* were provided with a long spine-like hair on the external side, towards the middle, of the hind metatarsi, while those of *carinalis* with none. This seemed quite hopeful. So I reexamined the male specimens of probable *nipponensis* from Jozankei and Sounkyo. To my disappointment, however, only 9 specimens out of 20 were provided with the spiniform hair, sometimes on one alone of the hind metatarsus. Moreover, in some cases it was presumed that the spine was lost after emergence and in other cases it was discovered that it was not well developed and rather close in character to the normal stiff hairs. I examined all of my male specimens in question from this point of view, taking into account other distinctions. The results which were determined sometimes with difficulty were as given in Table 3.

Table 3. Characters of males of the mixed specimens of *C. nipponensis*

Hind metatarsus	With a spiniform hair																			
Antennal scape	Without macula								With macula								Without			
Clypeus	No macula				With macula				No macula				With macula				No macula			
Clypeal swelling	ab. mid.		mid.		ab. mid.		mid.		ab. mid.		mid.		ab. mid.		mid.		ab. mid.		mid.	
Sculpture of A. D.	r p	p	r p	p	r p	p	r p	p	r p	p	r p	p	r p	p	r p	p	r p	p	r p	p
Hokkaido specimen	4	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6	3	0	0
Honshu specimen	3	1	0	0	1	0	0	0	5	1	0	0	21	8	0	0	2	1	0	0
Total	7	6	0	0	1	0	0	0	6	1	0	0	21	8	0	0	8	4	0	0

Abbreviation : ab. mid. ··· above middle, mid. ··· middle, r p ··· rugoso-punctate.

From the Table it seems to be concluded that the specimen having a distinct spine on the outer margin toward the middle of the hind metatarsus is the male of *nipponensis* and that the specimen without such a hind-metatarsal spine and with the maculated antennal scape together with the typically convexed (without any slight depression before the anterior margin) and well maculated clypeus is the male of *carinalis*. However, with reference to the specimens having no

metatarsal spine the problem still remains unsolved, because not a less number of the probable *nipponensis* ♂ captured in Jozankei were unarmed on the outer margin towards the middle of the hind metatarsus. Of these unarmed specimens, those without maculae on the antennal scape and the clypeus, and with the clypeus most highly elevated at above the middle are considered to have a high probability of being the males of *nipponensis*. But as for the specimens in which the scapes and the clypeus are maculated and the elevation of the clypeus can not distinctly be classified I can hardly say to which species they should be referred.

Notes on *Cerceris pedetes* found in Japan

This species has hitherto been known from Korea and East Siberia, and is very close to *C. ferreri* V. d. Lind. Judging from the direct comparison of the female specimens and from the description of Kohl which is concerned only with the differences between the two species, it seems better to treat *pedetes* as a subspecies of *ferreri*. However, we do not know as yet the characters of the male of *pedetes* and as the characters of the male have very often the key to determine the affinity between species, *pedetes* was placed provisionally at the specific rank.

C. smithi Dalla Torre, 1890 (= *bicornuta* Smith, 1856, nec Guérin) known from N. China may belong to the same species as *pedetes*. From the description of Smith, however, we cannot determine whether it is a member of the group of *ferreri* or of *rufipes*[1].

A female specimen collected in the mountain region of Chichibu agrees well in characters with *pedetes*, excepting (1) punctuation stronger and closer (than *ferreri*, in the original description it is 'seichtere wennauch sehr ähnlich als *ferreri*') and (2) pygidial area with a small but distinct emargination at apex in middle (no mention was given by Kohl on this respect). With regard to the first point a specimen from Manchuria shows weaker and sparser punctuation (as described by Kohl) but it has also a similar minute emargination on the apical margin of the pygidial area. Another point of difference, though slight, is that the body length is somewhat larger (16.2–16.5 mm.).

Coloration : Black. A large macula along inner margins of eyes, appendix of clypeus except narrow marginal areas, a small spot on lateral lobes of clypeus, a spot behind eyes, antennae except apical half above, two maculae on pronotum, tegulae, postscutellum, two large maculae on posterior aspect of propodeum, ante-apical bands on tergites 1–5, (generally narrower than in *ferreri* but on 1 broad), legs except all coxae (hind coxae partly yellowish) and front trochanters partly, ferruginous yellow.

Structure : Clypeus and its appendix : Fig. 22, pygidial area : Fig. 23. Antennal joint 3 as long as terminal joint or the length of the clypeal appendix at the sides.

Specimen : 1 ♀, Nakasori, Chichibu, Saitama Pref., 22. Ⅶ. 1937, K. Tsuneki leg. ♂: Unknown.

1) Sickmann (1895) sunk *bicornuta* Smith as a subspecies of *tuberculata* (= *rufipes*)

and *carinalis*.

Without a spiniform hair											
macula				With macula							
With macula				No macula				With macula			
ab. mid.		mid.		ab. mid.		mid.		ab. mid.		mid.	
r p	p	r p	p	r p	p	r p	p	r p	p	r p	p
1	0	0	0	1	0	0	0	0	0	**0**	**1**
1	0	0	0	2	1	0	0	17	4	**5**	**6**
2	0	0	0	3	1	0	0	17	4	**5**	**7**

p. ··· punctate. A. D···Area dorsalis

III. *CERCERIS* OF KOREA

Cerceris of Korea has hitherto very poorly been investigated and only three species have fragmentally been known up to the present, namely *hortivaga* Kohl, *adelph* Kohl and *pedetes* Kohl. In this paper I enumerated 16 species, but probably these may represent only a part of the true *Cerceris* fauna of the peninsula. Moreover, not a less number of the species are known through one of the sexes only and these must be supplemented by the future study.

It seems of interest in reference to the geographical distribution that *C. rybyensis* or its subspecies has not been found in Korea, because one of its subspecies, *rybyensis japonica*, is widely and very commonly distributed in Japan.

1. *Cerceris hortivaga* kohl, 1880

Cerceris hortivaga Kohl, Ferd. Zeitschr. Innsbruck. H. 24, S. 223, 1880 (Korea included) ; Sickmann, Zool. Jb., Syst., 8 (2), p. 204, 1895 (Tientsin and Korea).

Cerceris unifasciata Matsumura (nec Smith), Thous. Ins. Jap., Suppl. Ⅲ, p. 115, 1911.

Cerceris harmandi Pérez, Bull. Mus. Paris, 11, p. 152, 1905, ♂ (nec ♀); —— Sato, Kontyu, 2 (2), p. 96, 98, 1927; —— Yano, Icon. Ins. Jap., Ed. Ⅰ, p. 278, 1932; Ibid., Ed. Ⅱ, p. 1468, 1950; —— Yasumatsu, Jour. Fukuoka Nat. Hist. Soc., 2 (2), p. 68, 1937 (Tsushima);—— et Okabe, Festsehr. 60 Geburtst. E. Strand, 1, p. 499, 1936.

Specimens examined : 20 ♀♀ 1 ♂, Shoyozan, 10. Ⅵ.-3. Ⅸ. 1941-43; 4 ♀♀ 1 ♂, Kodaisan, 21. Ⅵ.-27. Ⅵ. 1943; 1 ♀, Temmasan, 31. Ⅶ. 1942 (K. Tsuneki leg.); 1 ♀, Shu-otsu, 3. Ⅶ. 1935; 1 ♀, Kongosan, 7. Ⅶ. 1935; 1 ♀, Gyokusenji, 21. Ⅵ. 1936; 1 ♀ 2 ♂♂, Kayasan, 15. Ⅸ. 1926 (K. Takeuchi leg.); 2 ♀♀ 3 ♂♂, Utsuryo Is., 5. Ⅶ. 1956 (C. W. Kim leg.).

Distribution : Japan, Korea, N. China, Europe.

Remarks. The female specimens from Korea as well as from Japan are on an average slightly larger than the typical form in Europe, measuring mostly about 12 (9–13) mm in body length, but the males are not markedly large (7–9 mm). In coloration the examples from Korea are considerably varied in contrast with those from Japan which are rather uniform in maculation. The following variation could be observed (in 30 ♀♀ 4 ♂♂) :

a) Two spots on pronotum (usually lacking in the Japanese specimens) : 7 ♀♀ only.

b) Postscutellar maculae : 7 ♀♀ (not always coinciding with specimens of (a))

c) Maculae on tergite 2 : 28 ♀♀ 1 ♂; on 3 : All spec.; on 4 : 13 ♀♀ 1 ♂; on 5 : All ♀ 2 ♂♂; on 6 : All ♂.

d) Macula on antennal scape : 29 ♀♀ 3 ♂♂.

The band on tergite 3 more or less deeply and roundly excavated in front, maculae on 4 when present always small, at most linear, usually represented by two or three dots, macula on 5 in ♀♀ variable in size, sometimes consisting of two large spots fused together. Such being the cases, the general tendency of maculation in this species is rather close to *C. rybyensis japonica* rather than *hortivaga* occurring in Japan. But the characters of the 2nd-sternal platform, relative length of the antennal joints, the detailed structure of the clypeus and the pygidial area well agree with those of *hortivaga* Kohl.

2. *Cerceris sabulosa subgibbosa* Yasumatsu, 1935 (*conj. nov.*)

Cerceris subgibbosa Yasumatsu, Rep. lst Sci. Exp. Manchukuo, Sec. V, Pt. 12, Art. 66, p. 15, 25, 1935.

Specimens examined : 3 ♀♀ 1 ♂, Shoyozan, 9. Ⅶ, 3, 17. Ⅸ. 1942, 43; 1 ♀, Keijo, 14. Ⅵ. 1941,

K. Tsuneki leg.

Distribution : Korea and Manchuria (Jehol)

Remarks. *C. subgibbosa* was described basing on a single female specimen collected in Jehol, Manchuria or N. China. The author carefully compared the specimen with a female specimen of *emarginata* Panzer (now *sabulosa* Pz.) from Switherland to which the example was considered very close and enumerated several characters by which the two species could be separated :

(1) Ratio of width to length of face. (2) Divergency of the inner margings of eyes. (3) Markings on pronotum and scutellum. (4) Sculpture on area cordata. (5) Point of junction of the wing vein, M3+4 and R4. (6) Puncture on abdomen. (7) Outline of the platform of sternite 2.

It was regretted, however, that the specimens he used for comparison were represented by a single female only from the respective region. According to my examination of specimens at my hand (4 ♀♀ 4 ♂♂ from Europe and 4 ♀♀ from Korea) all the differences he described but the first two fell within the range of variation of *sabulosa* of our region. But the first two, *viz.* (1) face comparatively wider and (2) more markedly divergent below, in the Asiatic specimens seem worthy of notice. So. I measured (a) length between lower edge of antennal socket and apex of clypeus, (b) interocular distance at antennae and (c) the same at base of lateral lobes of clypeus. The results were as given in Table 4.

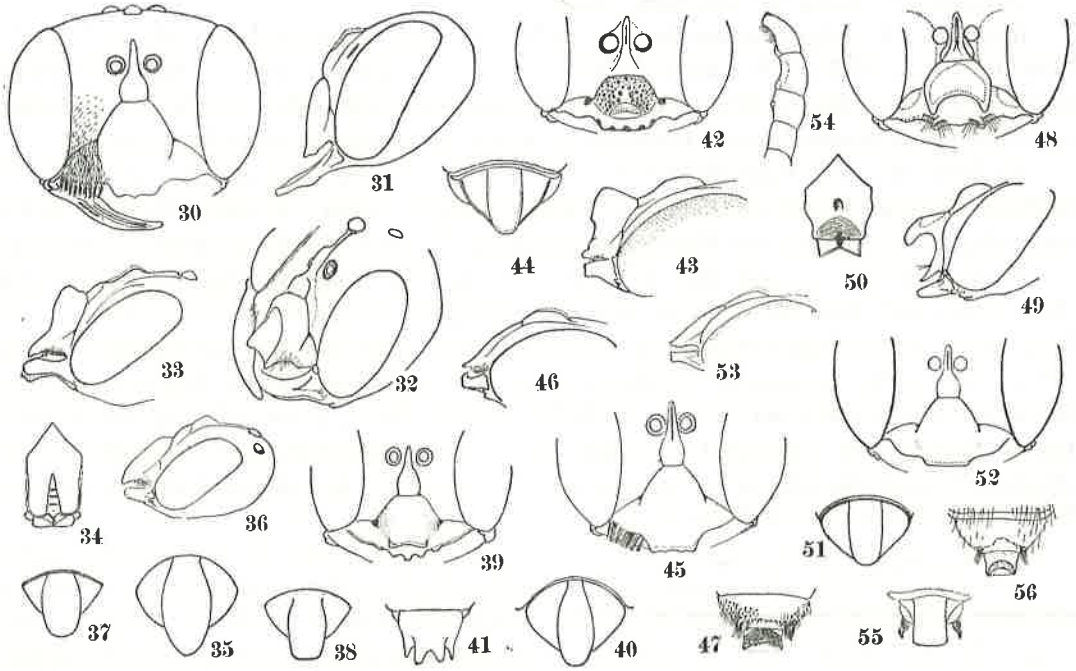
Table 4. Facial indices showing relative width of the face (*C. sabulosa*)

No.	European specimens			Korean specimens		
	(a)	(b)	(c)	(a)	(b)	(c)
1	39	42	48	46	48	56
2	33	34	39	33	34	38
3	35	35	40	41	40	47
4	33	35	40	43	43	50
Total	140	146	167	153	155	191
Ratio	1 : 1.04			1 : 1.01		
		1 : 1.14			1 : 1.23	
	1 : 1.20			1 : 1.25		

The result of (b) : (c) indicates that in the Korean specimens foreward divergence of the face is somewhat stronger than in the European. But the difference together with those of other indices is not so large as worthy of specific separation, so *subgibbosa* was sunk to a subspecies of *sabulosa*. The males also have the same tendency of difference as in the females.

♂. Length 9 mm. Black. Face, clypeus except apical margin narrowly, interantennal carina, tegulae. postscutellum, abdominal tergite 2 at base, 3–6 on apical bands and legs largely yellow. Maculae on face extending upwards above antennal sockets on the sides, abdominal bands on 3 (broadly emarginate in front) and 6 broad, and on 4 and 5 narrow. Front coxae and trochanters, mid and hind coxae largely, mid trochanters partly, front and mid femora at base on posterior margin, hind femora posteriorly and a macula on apical portion of hind tibiae blackish. Antennal flagella beneath ferruginous, apical margins of abdominal segments brownish. Face narrower than in ♀, as well as ♂ of the nominate race (a:b : c=41 : 38 : 44), median lobe of clypeus convex, with relative length to width 28 : 22, apex truncate, antennal joint 3 slightly less than twice as long as wide at apex. Pronotum well developed, with sides well elevated, platform on sternite 2 margined by vertical wall, in form as in ♀ (posterioriorly roundly produced and reaching slightly less than half of the elevated area of the segment). Sternites 3–6 strongly elevated on ante-apical line and markedly swollen at the sides, on 5 and especially 6 slightly produced posteriorly. Pygidial area : Fig. 38. Punctures as usual coarser and stronger than in ♀, on propodeum and tergite 1 reticulate, area cordata obliquely very coarsely striate on marginal areas, on medio-basal area irregularly more weakly rugulose, tergites 2 and 3 subreticulate, 4 with punctures larger than the interspaces.

Allotype : ♂. Shoyozan, M. Korea, 3. Ⅸ. 1942, K. Tsuneki leg.



Figs. 30–56. 30–31 : *Cerceris sobo* Yas. et Ok., ♂. 32–37 : *C. supraconica* sp. nov. (32–35, ♀; 36–37, ♂, 34 metasternum). 38 : *C. subgibbosa* Yas., ♂ (pygidial area). 39–41 : *C. koma* sp. nov., ♀ (41, apical sternite). 42–47 : *C. coreensis* sp. nov. (42–44, ♀; 45–47, ♂). 48–55 : *C. hokkanzana* sp. nov. (48–51, ♀; 52–55, ♂). 56 : *C. koryo* sp. *nov.* ♂ (apical two sternites).

3. *Cerceris supraconica* sp. nov.

This species is a member of the group *rybyensis*, but is slightly deviated from others in the form of the clypeus. Amongst the known species it seems closest to *E. eugenia* Schletterer, (1887) (= *C. orientalis* Mocsáry, nec Smith), but differs from it in the detailed form of the clypeus and in the structure of the pygidial area and in the character of the interantennal carina.

♀. Length 13.5–14.0 mm. Black with the following portions orange or lemon yellow : Face below antennae including interantennal carina, clypeus except the apical margin of the median lobe, antennal scapes, mandibles except apices broadly and inner margin, a spot on upper portion behind eye, a short streak on temple below along outer orbit of eye, a spot varying in size (sometimes completely lacking) behind base of mandible, two lateral spots on pronotum, wingtegulae, a faint transverse macula (mostly lacking) on scutellum, postscutellum, two (sometimes one) spots on mesopleuron, two (or one) lateral spots on each side of posterior aspect of propodeum, a large macula at base and an intermittent transverse band befor apex (sometimes turning into a lateral spot, sometimes completely disappeared) of abdomintal tergite 2, tergites 3 and 5 wholly except each frontal incision, medianly interrupted transverse narrow band on apical margin of 4, a large macula on each side of sternites 2–5 (on 2 sometimes confluent into a band) and legs except a macula at base on posterior aspect of front and mid femora, a similar but larger macula on apical portion and apical plate of hind femora and a fleck at apex of hind tibiae. Antennae broadly ferruginous beneath and fuscous above. Wings apically slightly clouded, markedly so on anterior

apical regions.

Head from above with ocellar area slightly raised, OOD : POD : OCD = 16 : 12 : 21, with upper clypeal elevation produced in front, conic in form with apex slightly emarginate, interantennal carina reaching anterior ocellus as a lower ridge which is well defined seen in profile. Head seen in front with inner orbits of eyes distinctly divergent below, ratio of interocular distance at sockets of antennae and at lateral base of clypeus approximately 50 : 57, clypeus abruptly raised on upper portion (at about 3/4 from apex) and broadly, rather deeply concavely impressed in front, the impression distinctly divergent below, with sides bluntly ridged, apex dilated, slightly produced at sides and broadly gently emarginate (Fig. 33); supraclypeal area also slightly raised, not distinct on outline (Figs. 32 and 33); mandibles with two blunt teeth on inner margin towards middle. Antennal joint 3 twice as long as wide in the narrowest (upper) view, joints 4–9 longer than wide, 10 and 11 as long as wide (in the narrowest view). Pronotum with corners rounded, anterior propleural ridge higher and acuter than in most of the allied species (*e. g. rybyensis*, close to that of *hortivaga*), without mesopleural tooth, area dorsalis on propodeum convex, deeply and broadly margined by coarsely crenate furrow, with a similar median furrow, which is always roundly and deeply pitted at apex, posterior aspect rounded with medio-distal impression rather small. Sternite of metathorax : Fig. 34. Abdominal tergite 1 slightly broader than long (sometimes nearly as long as wide), apical margin not provided with a vertically raised semitransparent membrane; pygidial area : Fig. 35. Basal platform of sternite 2 semi- or rather 2/3-circular, distinctly outlined, reaching half of the raised area of the segment (except apical depressed membraneous part); sternite 5 with lateral portions swollen and posterior margin slightly produced (but not toothed anywhere), with median portion slightly impressed. Basal lobe of hind wing ncarly 1/3 as long as anal cell.

Upper front longitudinally, somewhat obliquely, more or less rugosely punctate-striate, lower front (face) and clypeus rather sparsely and very coarsely rugoso-punctate, punctures on vertex, mesonotum and propodeum coarse and dense, somewhat rugoso-reticulate, on scutellum coarse but sparse, intervals partly larger than punctures, on postscutellum fine and sparse; area dorsalis polished, with sparse fine punctures scattered. Abdominal tergites coarsely punctate-reticulate, everywhere punctures larger than the interspace. Basal platform on sternite 2 scattered sparsely with medium-sized punctures, rest of the sternite longitudinally coarsely but not strongly striate, sternites 2–6 with latero-posterior somewhat swollen areas punctured with several gross points.

♂. Similar in general coloration to ♀, but in the specimen temporal, mesopleural and propodeal maculae lacking. Tergite 2 with a posterior lateral macula beside the large one at base, 3–5 with a medianly attenuate marginal band which is broader on posterior segments. Maculae on sternites as in ♀ in pattern, legs similarly coloured excepting hind femora which are wholly black and all tarsi which are apically fuscous. In structure also similar to ♀ excepting clypeus, mandibles and pygidial area. Clypeus with median lobe elongate hexagonal, nearly 2/3 as long as wide at apex and adruptly elevated at base, the elevation not so high as in ♀ and gently roundly inclined towards apex (Fig. 36), the surface transversely convex, apical margin nearly truncate but with a very feeble tooth produced in middle, supra-clypeal area also somewhat raised and interatennal carina reaching anterior ocellus as in ♀. Mandibles simple. Pygidial area : Fig. 37. Punctuation similar to that of ♀, but in general relatively coarser and closer.

Holotype : ♀, Mt. Kaya, Ⅷ, 1926, Hasegawa leg.

Allotype : ♂, Ibid.

Paratypes : 2 ♀♀, Ibid.; 1 ♀, 13. Ⅷ. 1942, K. Tsuneki leg.

4. *Cerceris sobo* Yasumatsu et Okabe, 1936

Cerceris sobo Yasumatsu et Okabe, Festschr. 60 Geburtst. E. Strand, 1, p. 497, 1936: —— Yasumatsu,

Ins. Jap. Ill. Icon., p. 373, 1939.

The Korean specimens examined well agree in characters with the original description. I also examined 2 female paratypes sent by the original author. This species represents a particular group. In colour it is similar to the members of group *rybyensis*, but characteristic in the clypeal structure and the platform of the 2nd sternite of the abdomen. In biology it captures weevils as food for the young. Some additional morphological notes :

Mandibular teeth : Fig. 16, basal one smaller than the apical. Clypeus : Fig. 16. Pygidial area : Fig. 17. Antennal joint 3 about 2.3 times as long as wide at apex, all joints longer than wide. Basal lobe of hind wing nearly 1/4 as long as anal cell.

♂. Hitherto undescribed. Length 10 mm. Similar to ♀, differing in the structure of clypeus, mandible and pygidial area as usual.

Head seen in front : Fig. 30, seen in profile : Fig. 31, pygidial area normal. Sternite 2 with platform vaguely defined, very low, not strongly outlined and slightly produced on posterior margin in middle, not provided with two tubercles as in ♀. Antennal joint 3 approximately 2.3 times as long as wide at apex in the dorsal (narrowest) view, joints 4–10 longer than wide, from joint 4 apically each joint gently roundly produced beneath, terminal joint slightly bent and attenuate towards apex, apex obliquely truncate. Punctuation generally as in ♀. Median lobe of clypeus glossy, with punctures sparser on the median area, lateral lobes dull and more finely punctured.

Specimens examined : 4 ♀♀, Shoyozan, 2. Ⅷ. 1943, K. Tsuneki leg. 1 ♂ (Allotype), Gyokusenji, 21. Ⅵ. 1926, Hasegawa leg.

Distribution : Japan and Korea.

5. *Cerceris koma* sp. nov.

This species belongs to the group of *rubida* Jurine and most closely related to *C. tango* Shestakov known from Mongolia (Alashan) but differs from it in the genral punctuation, the form of the pygidial area and in colour. It seems apparently similar to *C. kozlovi* Shestakov, but is different from it in the general punctuation of the head and thorax (especially of the area cordata) and in having the basal platform of the 2nd sternite of the abdomen and the apical impression of the 1st tergite. This species is distinguished from *rubida* itself by its different punctuation of the area cordata and in colour pattern.

♀ Length 9.0 mm. Black. Cream to golden yellow : Face below antennae, clypeus except apical margin and apex of appendix, a spot on upper portion of temple behind eye, neck, medianly interrupted broad band on pronotum, a touch on propleuron, wingtegulae, two large rounded maculae on scutellum, postscutellum wholly, two large maculae on propodeum, a large macula on upper portion of episternum of mesopleuron, base and apical irregular shaped band of abdominal tergite 2, medianly attenuate apical band on tergites 3, 4 and 5, a large central macula on sternite 1, medianly interrupted circular macula at base of sternite 2, also 2 lateral spots and postero-lateral corners of the sternite, laterally broadened apical band on sternite 3, front and mid legs (except greater part of coxae, outer face of trochanters, greater part of femora and an inner broad streak of tibiae), and hind legs on apex of coxa, trochanters, a spot near apex of femora and tibiae beneath. Antennae brownish black, beneath broadly ferruginous, front and mid tarsi apically brownish, hind tarsi much darker. Wings hyaline, radial cell and the area external to it dark brown. Lower front and clypeus distinctly covered with short white pubescence which is denser and longer on lateral lobes of clypeus.

Head from above with OOD : POD = 13 : 8, seen in front : Fig. 39, with ratio of interocular distance at upper end of eyes, at antennae and at lateral base of clypeus 43 : 37 : 40, clypeal lamella

(appendix) nearly flattened above, not particularly raised, with apex gently roundly emarginate; apex of the ground part of clypeus bluntly tridentate, the distance between the median tooth and middle of apical emargination of lamella nearly half as large as the length of the apical margin of lamella; supraclypeal area not high, interantennal carina fringed above with lamellar semitransparent membrane, mandibular dentation unobservable. Antennae with scape nearly as long as joints 2 and 3 combined, joint 3 2.2-times as long as wide at apex, joints 6–11 slightly longer than wide, terminal joint twice as long as wide at base. Pronotum with antero-lateral corners rounded, propleural carina distinct and acute. Area dorsalis on propodeum gently convex, with fine median groove, lateral furrows broad, triangular in cross section, posterior inclination rounded, not particularly impressed in middle. Abdominal tergite 1 slightly longer than wide, with a small ante-apical impression. Pygidial area : Fig. 40. Sternite 2 with platform not distinctly outlined, vaguely raised, its apex attaining as far as about 2/5 of the incrassate region of the segment, apex of the incrassate area of sternites 4 and 5 acutely margined and gently roundly emarginate. End sternite : Fig. 41. Basal lobe of hind wing slightly more than 1/4 as long as anal cell.

Vertex moderately largely punctate-reticulate, upper frons more finely and closely rugoso-punctate, lower frons (face) fairly closely, clypeus sparsely punctate, with intervals microscopically finely punctulate. Punctures on mesonotum irregular both in size and shape, longitudinally but not closely subrugose, on scutellum larger, sparser except medianly at apex, on propodeum medium-sized, sparser, with interspace larger than points and duplipunctate, area cordata finely and very sparsely punctulate, polished. On abdominal tergites punctures sparse, with interspace larger than points and scattered with finer points, on tergite 5 punctures nearly uniform, fine and numerous with surface dull and opaque. Pygidial area coarsely irregularly wrinkled.

Holotype : ♀, Hokkanzan, Keijo, 6. Ⅸ. 1942, K. Tsuneki leg.

6. *Cerceris bicincta* (Klug, 1835)

Cerceris quadrimaculata Dufour (1849) et auct. ;—— Yasumatsu, Mushi, 14 (2), p. 108, 1942. (N. China and Inner Mongolia)

Cerceris bicincta Beaumont, Mitt. Schweiz. Ent. Ges., 23 (3), p. 321, 1950; Ann. Soc. Ent. France, 219, p. 31, 32, 36, 53.

Specimens examined : 1 ♀, Kainei, 1. Ⅷ. 1935, K. Takeuchi leg. ; 1 ♀, Shoyozan, M. Korea, 10. Ⅵ. 1943, K. Tsuneki leg.

Distribution : Korea, N. China, Mongolia, Turkestan, Europe.

7. *Cerceris albofasciata* (Rossi, 1790)

Vespa albofasciata Rossi, Faun. Etrusc., Ⅱ, p. 87, 1790.

Crabro albofasciata Rossi, Faun. Etrusc. Mant., Ⅱ. p. 138, 1792.

Cerceris luctuosa Costa, Ann. Mus. Zool. Univ. Napoli, 5, p. 105, 1869; —— Sickmann, Zool., Jhlb., Syst. 8 (2), p. 204, 1895 (Tientsin); —— Yasumatsu, Mushi, 14 (2), p. 108, 1942 (Mongolia).

Cerceris navitatis Smith, 1873 and Japanese authors.

Specimens examined : 15 ♀♀ 6 ♂♂, Keijo, 25, 29, 30. Ⅵ. 1941; 2 ♀♀ 1 ♂, Shoyozan, 25. Ⅵ, 4. Ⅷ, 3. Ⅸ. 1943, K. Tsuneki leg.

8. *Cerceris arenaria* (Linné, 1758)

Sphex arenaria Linné, Syst. Nat. Ⅰ, Ed. 10, p. 571, 1758.

Cerceris arenaria Schletterer, 1887, p. 413; —— Beaumont, 1950a, p. 57; —— Yasumatsu, 1935, p. 73 (Dairen, Manchuria)

Cerceris quinquecincta Ashmead, 1904, (p. 61) and Japanese authors.

Specimens examined : 8 ♀♀ 2 ♂♂, Shoyozan, 10, 18, 27. Ⅵ; 2, 9. Ⅶ; 27. Ⅷ; 3. Ⅸ. 1942, 43; 2 ♀♀ 1 ♂, Kodaisan, 2, 7. Ⅵ. 1943; 1 ♂, Keijo, 20. Ⅵ. 1943. K. Tsuneki leg.; 1 ♀, Mt. Kongo, 7. Ⅷ. 1936, K. Takeuchi leg.

9. *Cerceris adelpha* Kohl, 1887

Cerceris adelpha Kohl, in Schletterer's Palaearktischen *Cerceris* 1887, p. 447 (Korea); Arch. Naturg., Abt. A. 81 (7), p. 107, 1915 (Korea); —— Yasumatsu, Mushi, 14 (2), p. 108, 1942 (Mongolia).

Remarks. I could not examine specimens captured in Korea, but will give explanation about this species in connection with *Cerceris* of Manchuria and Mongolia.

10. *Cerceris pedetes* Kohl, 1887

Cerceris pedetes Kohl, in Schletterer's Palaearktischen *Cerceris*, 1887, p. 449 (Korea); Arch. Naturg., Abt. A. 81 (7), p. 119, 1915 (Korea and Siberia)

Remarks. I did not examine the Korean specimen, but observed a female specimen from Japan (p. 35 of this paper) and one female specimen from Manchuria.

11. *Cerceris hokkanzana* sp. nov.

The female of this species is close to *C. ferreri* Lind., differing slightly in the form of the clypeal appendix and of the pygidial area and in punctuation. But in the male the difference is quite marked : Clypeus with median lobe relatively broader and truncate at apex, antennal joints relatively much shorter and sternite 6 provided with a tuft of hairs on each side posteriorly. This species seems also near to *C. semilunata* Rad., especially in the form of the clypeal appendix. I cannot, however, identify the specimens at hand with this species by such an incomplete description, since more than one species in our region possess the clypeus of similar structure. The present species differs from *semilunata* at least considerably in coloration.

♀. Length 11–12 mm. Black. Two large lateral maculae on face, centeral triangular macula on clypeal appendix, a latero-basal spot on lateral lobes of clypeus, basal half of mandibles, a spot on upper temple behind eye, two elongate spots on pronotum, tegulae of wings in part, two spots on postscutellum, sometimes also on propodeum, medianly interrupted band (sometime two spots) on tergite 1, medianly attenuate narrow band on ante-apical margins of tergites 2–5, front and mid tibiae and tarsi, hind tibiae in front, orange yellow. Outer margins of front and mid tibiae, brownish, Antennae brownish black, beneath ferruginous. Wingveins and hind tarsi dark brown.

Head seen from above with OOD : POD = 17 : 12, postocellar and interocellar furruws defined, seen in front : Fig. 48. Clypeal appendix comparatively thick, nearly as long as wide and deeply semilunately emarginate in front, with sides roundly curved, its periferal areas except apex inclined and the surface flattened, forming about 45° with ground surface of face (Fig. 49), apical margin of the ground part of clypeus nearly straight (with some variations) and provided on each side with a keeled tooth. Antennal joint 3 in the dorsal (narrowest) view 2.7 times as long as wide at apex. Pronotum anteriorly and antero-laterally gently inclined, postero-laterally slightly elevated. Metasternum : Fig. 50. Abdominal tergites other than 1 not impressed at apex in middle. Pygidial area comparatively broader than in *ferreri* (Fig. 51). Basal lobe of hind wing about 1/4 as long as anal cell.

Punctuation generally similar to that of *ferreri*, but generally stronger. On vertex punctures rather fine, close, rugoso-reticulate, upper front more finely rugoso-punctate, face and appendix of clypeus finely and sparsely punctured, median lobe just below the appendix impunctate, polished. Pro–, mesonotum and scutellum duplipunctate, larger ones rather sparse and partly rugose; propodeum rugoso-reticulate, area dorsalis longitudinally, slightly obliquely striate. Punctures on tergites 3 and 4 sparse, with intervals

broader than points, especially so on yellow bands of tergites 2–4.

♂. Length 8–9 mm. Black with the maculation of thorax and abdomen similar to ♀. Face below antennae, clypeus except apical margin, scapes in front and a spot behind eye yellow. Postscutellllum wholly yellow, propodeum always and tergite 1 freguently without maculae. Tergite 6 with a band, sternites 2–4 with a macula on each side. Legs yellow except : front coxae, trochanters and femora externally, ante-apical macula on hind femora. Hind tibiae and tarsi ferruginous yellow, turning dark brown apically.

On vertex OOD : POD = 12 : 10, inner margins of eyes slightly divergent below (Fig. 52), median lobe of clypeus only slightly longer than wide (ratio 22 : 20), basally gently convex and apically flattened (Fig. 53), with apical margin somewhat raised and usually truncate (sometimes with a feeble median tooth), antennal joint 3 about 2.5 times as long as wide at apex, end joint strongly bent and furnished with 7–8 comparatively long hairs beneath (Fig. 54); apical impression on tergite 1 distinct, sternite 6 (Fig. 55) provided with a tuft of hairs on each side at apex which bundled apically as if glued together and after once turning outward directing inward; sternite 7 with an apical fringe of hairs, fine, not long but fairly dense. Basal lobe of hind wing as in ♀. Punctuation also as in ♀, but generally somewhat stronger. Face and lateral lobes of clypeus duplicately punctate, not shining, while median lobe punctures fine and sparse, very glossy, especially on apical and medial portion where impunctate. Mesonotum and scutellum with micro-points on the interspace of punctures less numerous and rather glittering. Propodeum in some specimens as in ♀, in others puncures slightly remote with considerable interspace (but narrower than punctures), punctures on abdomen similar to the state in ♀.

Holotype : ♀, Hokkanzan, Keijo, 6. Ⅸ. 1942, K. Tsuneki leg.

Allotype : ♂, Shoyozan, M. Korea, 3. Ⅸ. 1943, K. Tsuneki leg.

Paratypes : 1 ♀ 2 ♂♂, Shoyozan, 3, 10. Ⅸ. 1943; 1 ♀, Hokkanzan, 31. Ⅷ. 1941, K. Tsuneki leg.; 3 ♂♂, Kainei, N. Korea, 1. Ⅷ. 1935, K. Takeuchi leg.

12. *Cerceris koryo* sp. nov.

♂. Length 10.3 mm. General structure and coloration very similar to those of the above described species ♂. But the basal lobe of the hind wing is larger (slightly more than 1/3 as lang as anal cell), flagellar joints of antennae relatively slightly shorter, with different body punctuation. Colour of hind legs and state of the tufts of hairs on the 6th sternite are also different. In the comparison with the European representatives, the specimen is closest to 5-*fasciata* ♂, but differs from it in the relative length of the antennal joints, the general punctuation and in the colour of the hind legs.

Antennal joint 3 about 2.3 times as long as wide at apex, joints 5–12 as long as wide or apically slightly shorter than wide, end joint distinctly shorter than any of the two above compared and more strongly attenuate apically, hairs grown beneath only 2 or 3 and very short. Clypeus with median lobe distinctly longer than in the above two, ratio of length to width 29 : 23 (in 5-*fasciata* 25 : 23), the surface more strongly convex and medianly longitudinally elevated, without anterior flattened area, apical margin with sides bluntly angulate and medianly feebly dentate, the surface glossy, with sparse medium-sized punctures all over; face and lateral lobes of clypeus also glossy, more finely punctured with intervals scattered with minute points. Inner margins of eyes slightly divergent below (ratio of interocular distance at base of antennae and at lateral base of clypeus 44 : 48). Sternite 6 with a tuft of hairs on each side at apex which is not bundled towards apex as if glued together, apical portion of the hairs gently curved outwards, sternite 7 glabrous, without apical fringe of hairs (constant ?) (Fig. 56). Punctures on head above fine and irregular in size, less rugose, on mesonotum slightly larger, longitudinally elongate and each shallowed posteriorly with intervals scattered with minute points. Propodeum rugoso-subreticulate. Punctures on tergite 1 relatively large, on others smaller, irregular in size, vague in outline and sparse, intervals on an average larger than points.

Coloration of body as in preceding species. Legs : Front and mid legs yellow with following black maculae : Front coxae wholly, mid coxae except apex, greater part of tront trochanters, a touch at base on outer surface of front femora. Hind legs black, with base of tibiae and all tarsal joints brownish.

Holotype : ♂, Koryo, M. Korea, 9. Ⅶ. 1943, K. Tsuneki leg.

13. *Cerceris ruficornis* (Fabricius, 1793)

Philanthus ruficornis Fabricius, Ent. Syst., Ⅱ, p. 292, 1793
Crabro labiata Fabricius, Ent. Syst., Ⅱ, p. 296, 1793 (nec Olivier) (ex parte); —— auctt.
Crabro cunicularis Schrank, Taun. Bioc., Ⅱ, p. 334, 1802 (♀).
Cerceris cunicularia Beaumont, 1950 a, p. 31, 34, 38, 70.
Cerceris ruficornis Van der Vecht, Zool. Verh., 48, p. 65, 1961.

Specimen : 1 ♂, Mt. Hakuto (Jimmjo), N. Korea, 4. Ⅷ. 1942, K. Tsuneki leg.

Remarks The example well agrees in characters with the descriptions of previous authors, except that the 3rd joint of the antenna seems slightly longer, 2.5 times as long as wide at apex in the narrowest view and longer than the 4th. (My specimens of *ferreri* which is said to have a similar antennal structure to *cunicularia* shows the same relative length as given above concerning the Korean specimen.)

14. *Cerceris quinquefasciata seoulensis* subsp. nov.

The present subspecies differs from the nominate race only in the following points :

♀. 1) Incision of the apical margin of clypeus less marked, rather similar to 4-cincta and the margin thinner.

2) Punctures on abdomen very sparse and fine, intervals 2–5 times (mostly 3–4 times) as large as the points. This is not only on tergite 2–5, but also on 1.

3) Pygidial area similar in form but with surface more roundly raised.

♂. 1) Median lobe of clypeus more broadly convex, only on apical portion narrowly flattened.

2) Antennal joints shorter, joints 7–12 nearly as long as broad.

3) Punctuation on abdomen very sparse as in ♀, but relatively somewhat larger than in ♀.

4) Hairs on apical margin of sternite 7 short and not bent, but are very fine and delicate, defined by the oblique light only. Tuft of hairs on lateral angles of sternite 6 similar to the case in the nominate form.

Holotype : ♀, Seoul (Keijo), 20. Ⅵ. 1941, K. Tsuneki leg.

Allotype : ♂, Ibid. Paratypes : 1 ♀ 1 ♂, the same locality, 25. Ⅵ. 1941, K. Tsuneki leg.

15. *Cerceris quadrifasciata* (Panzer, 1799)

Philanthus quadrifasciata Panzer, Faun. Germ., 63, p. 14. 1799
Cerceris quadrifasciata Schletterer, 1887, p. 425; —— Beaumont, 1950 a, p. 35, 38, 59.

Specimen examined : 1 ♀, Shoyozan, 7. Ⅵ. 1936, K. Takeuchi leg.

Distribution : Korea, Manchuria and Europe.

Remarks. This species is apparently similar to *C. 5-fasciata* (Rossi), but the female is easily separable therefrom by the body and legs less rich in yellow maculation (thorax entirely and legs up to before apex of femora black) and the median lobe of the clypeus more convex with the free end thin and lamellate. In the male abdominal sternite 6 without lateral tufts of hairs in this species, while in *5-fasciata* they are present, though not so dense as in *ruficornis* (= *cunicularia*) or in *hokkanzana*. Length ♀ 11mm, ♂ not as yet found in Korea.

16. *Cerceris coreensis* sp. nov.

The female of this species is somewhat similar to *C. eversmanni* in the form of the clypeus, but the male rather to *ruficornis*.

♀. Length 11.3–12.0 mm. Black. Yellow are : Mandibles at extreme base rather obscurely, 2 elongate large maculae along inner orbits of eyes, 2 small obscure spots on appendix of clypeus, a small spot on upper portion behind eye, tegulae in part, postscutellum (sometimes interrupted in middle), medianly interrupted apical bands on tergites 1–4 (on 1 turned into lateral spots). Mandibles dark brown to black, antennae beneath dark brown, on joints 4, 5 and 12 ferruginous. Front and mid tibiae and tarsi ferruginous, sometimes with yellowish tint, with external margin of tibiae (sometime mid tibiae only) dark brown. Hind tarsi (sometimes all tarsi externally) dark brown. Wings uniformly clouded, brownish.

Head seen from above with ocellar region slightly elevated, with OOD : POD : OCD = 13 : 11 : 18, seen in front with inner margins of eyes distinctly divergent below, interocular distance at antennae and at lateral base of clypeus 49 : 55, interantennal carina acute and high, extending as a striae to anterior ocellus. Clypeus and supraclypeal area : Figs. 42, 43. Appendix very thick, nearly conical, with lower (apical) surface flattened, subtriangular in form, forming a right angle with the upper surface (Fig. 43); the area just below the apical (lower) surface transversely excavated and continued to the vertical ground portion of clypeus which is smooth, apical margin provided with 3 small impressions and 4 gentle carinae and bordered behind by a row of short stiff hairs. Mandibular dentation not well observed, but apparently simple. Antennal joint 3 about 2.5 times as long as wide at apex, joint 8 1.4-times as long as wide, end joint as long as joint 3. Pronotum with lateral corners rounded, propleural carina comparatively weak. Mesopleuron with a short tooth on lower portion (not so marked and apt to be overlooked). Posterior inclination of propodeum rather gently excavated, abdominal tergite 1 with a distinct ante-apical impression, pygidial area : Fig. 44. Basal lobe of hind wing slightly less than 1/3 as long as anal cell.

Vertex rather finely, closely, subrugosely punctured, punctures rounded, shallow and distinct in outline, upper front longitudinally closely punctate-rugoso-striate, on lower front punctures irregular, shallow, mixed with fine wrinkles and very minute points, appendix of clypeus coarsely rugoso-punctate, apical triangular surface sparsely but distinctly punctured, the excavation just beneath and apical ground portion of clypeus smooth and polished. Punctures on mesonotum medium-sized, in part remoter than their own diameter, each puncture deep and distinct anteriorly and shallow and obsolete posteriorly, in part longitudinally subrugose; propodeum obliquely rugoso-reticulate, area dorsalis fairly closely obliquely rugoso-striate. On tergite 3 interspace as large as, or partly larger than points, on 4 on an average larger. Pygidial area transversely, basally and apically longitudinally finely rugulose or coriaceous.

♂. Length 10.7 mm. Similar to female in general structure (except clypeus) and punctuation. Yellow : Face below antennae (sides of maculae reaching as far upward as apical ends of antennal scapes stretched upward), clypeus except apex of median lobe, antennal scape beneath and the similar maculae to those of ♀ except that maculae on abdomen turning into medianly attenuate bands on tergites 2–6, and sternites 2–4 also adorned with lateral spots. Legs yellow; black in front legs, coxae wholly, trochanters externally and the greater part of outer side of femora; in mid legs, coxae basally, a spot on trocanters and outer base of femora; in hind leg, apical half of femora and tibiae except in front. Hind tarsi brown, apically darker. Wings uniformly clouded but apically much darker.

Head from above with OOD : POD = 6 : 5, seen in front (Fig. 45) with inner margins of eyes roundly divergent below, with ratio of interocular distance at antennae and at lateral ends of clypeus 43 : 50. Median lobe of clypeus with ratio of width to length 27 : 30, with apex bluntly produced at the sides and medianly indistinctly bidentate (constant ?), surface of the lobe flattened and apically gently raised (Fig. 46). Antennal joints similar to ♀ in length relation, joints beyond middle slightly longer than wide, apical three joints with a carina and an impressed smoothed area beneath, terminal joint comparatively

long, markedly bent. Mesopleural tooth very feeble, indistinct. Basal lobe of hind wing approximately 1/4 as long as anal cell. Lateral tufts of hairs on abdominal sternite 6 long, dense, but not glued together, pale brown in colour, with apex darker and bent ventrally, apical fringe of hairs on sternite 7 distinct but short and straight (Fig. 47).

In punctuation similar to ♀, but generally, as usual, slightly coarser and closer, on black areas of abdominal tergites punctures always larger than interspaces, on yellow bands more remote and intervals larger.

Holotype : ♀, Shoyozan, 27. Ⅷ. 1942, K. Tsuneki leg.
Allotype : ♂, Temmasan, 30. Ⅷ. 1942, K. Tsuneki leg.
Paratype : 1 ♀, Temmasan, 30. Ⅷ. 1942, K. Tsuneki leg.

IV. *CERCERIS* COLLECTED IN PEKING, NORTH CHINA

The material dealt with here were all collected by the writer himself on the promenade running through the wood which surrounded Tiendang, a famous place of Peking, during 1938 and 39 when he was there as a soldier. At that time the place was completely deserted and lived abundantly by various species of earth burrowing wasps. His biological observations made on these solitary wasps will be published in another paper.

1. *Cerceris hortivaga* Kohl, 1880

Synonymy : See p. 36. Distribution : p. 36.

Specimens examined : 4 ♀♀, 9. 12. Ⅵ. 1938.

Remarks. As already pointed out by Sickmann in 1895 the specimens from N. China are rich in yellow maculation on the abdomen and the legs. Most of the females have the 2nd and 3rd tergites nearly wholly yellow, and the blackish streaks on the tibiae are narrow and very weak.

2. *Cerceris sabulosa sinica* subsp. nov.

A single female specimen captured in Peking is characterized by (1) the colour of the abdomen and the legs, and (2) the form of the clypeus.

Abdominal segment 1 at apex and beneath, segment 2 wholly except medio-basal yellow macula and a yellow spot on each side of the tergite, and median line and apex of sternite 3 ferruginous. Legs yellow except front coxae and base of mid and hind coxae. Trochanters and femora more or less ferruginous, markedly so on inner surface of hind femora. Clypeus with median lobe not narrowed towards apex as done in the nominate form, but with the sides parallel up to the apex as in *sabulosa subgibbosa*.

Holotype : ♀, 13. Ⅷ. 1938.

3. *Cerceris distinguenda* Shestakov, 1922

Cerceris distinguenda Shestakov, Ann. Mus. Zool. Acad. Sci. Russ., 23, p. 27, 1922; —— Yasumatsu, Mushi, 14, p. 109, 1942.

Specimen examined : 1 ♀, 13. Ⅷ. 1938.

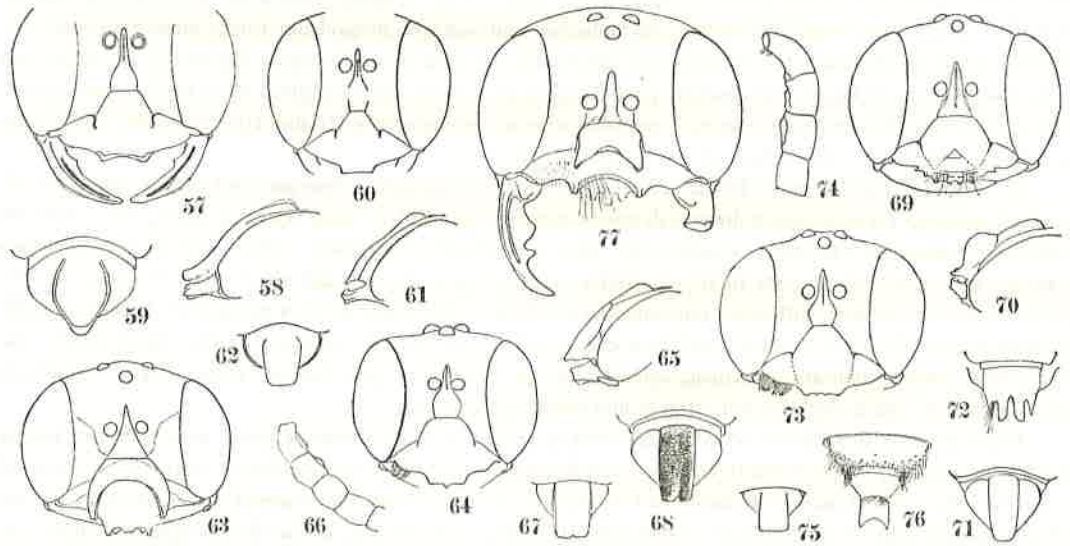
Distribution : N. and N. W. China.

4. *Cerceris pekingensis* sp. nov.

In the general coloration and sculpture this species seems most close to *C. gaetula* Beaumont known from N. Africa, but distinctly differs from it at least in the character of the clypeus and

pronotum. In the structure of the anterior portion of the clypeus this species resembles *C. pulchella* Klug, differing, however, in the structure of its posterior portion and pygidial area, in the spinosity of the legs and also in the colour of the abdomen.

♀. Length 8.0–9.5 mm. Black with the following portions yellow : Clypeus except anterior margin, face excepting the area around sockets of antennae, mandibles except apical 1/3, antennal scapes in front, two spots on pronotum (sometimes lacking), tegulae of wings, postscutellum (sometimes black), abdominal segment 1 (sometimes on posterior portion only), 2 and 3 wholly (sometimes constriction between 1 and 2 black), apical band on tergite 4 (narrow) and 5 (broad) and legs except front coxae and mid and hind coxae posteriorly. Maculae on pronotum and tergite 1–3 except apex more or less ferruginous. Apex of clypeus and antennae above brown to dark brown, antennae beneath ferruginous. Wings hyaline, apically clouded, veins dark brown, costa and stigma ferruginous. In some specimens two faint yellowish maculae defined on propodeum, and abdominal tergite 4 also ferruginous yellow.



Figs. 57–77. 57–62 : *Cerceris pekingensis* sp. nov. (57–59, ♀; 60–62, ♂). 63–68, *C. falcifera* sp. nov. (63, 68, ♀; 64–67, ♂) 69–76 : *C. tiendang* sp. nov. (69–72, ♀; 73–76, ♂). 77 : *C. rufipes evecta* Shestakov ♀.

Head from above with OOD as large as POD, seen in front : Fig. 57. Interocular ratio at antennae and at lateral base of clypeus 38 : 45, interantennal carina narrow and high, fringed above with semi-transparent membrane, supra-antennal area flattened downwards, becoming level with face, medial lobe of clypeus very slightly raised on upper portion (nearly flattened) and completely flattened on lower portion, with apical area raised, thus giving appearance transversely impressed on ante-apical area (Fig. 58), apical margin gently emarginate, its lateral portions incrassate and roundly produced anteriorly, as if to be bidentate (Fig. 57). Lateral lobes of clypeus and sides of face densely covered with short silver white pubescence, the pubescence anteriorly long, covering and concealing completely the apical margin, medial lobe and supra-clypeal area with pubescence short and sparse, but the former provided with two long setae and two shorter and finer ones just behind the apical margin in middle. Mandibles with a triangular tooth on inner margin before middle (Fig. 57). Antennae with joint 2 ellipitc, much wider than long, about 2/3 as long as wide, joint 3 comparatively short, 1.5 times as long as wide at apex, joint 7 about as long as wide, joints 8–11 wider than long, end joint longer than joint 3 (ratio 4 : 3). Pronotum

with latero-posterior areas transversely roundly raised, with anterior inclination vertical and laterally above bordered by a carina which extends on the side of pronotum as far below as lower end of propleuron, propodeum rounded, with posterior inclination gently excavated in middle. Tergite 1 without ante-apical impression. Pygidial area : Fig. 59. Legs normal. Basal lobe of hind wing nearly 1/3 the length of anal cell. Sternite 2 with the platform at base, rounded and well outlined at apex, reaching posteriorly half of the segment.

Vertex punctate-subreticulate, punctures mediocre and somewhat sparser than usual, upper frons finely very closely striate, lower frons and clypeus very sparsely punctured, with intervals microscopically finely punctate-rugulose, not glossy, lateral elevation of anterior margin of median lobe shining. Punctures on mesonotum mediocre, rounded and very sparse, always with intervals much larger than points, punctures on scutellum somewhat smaller and similarly sparse; propodeum sparsely punctured, more sparsely so around area cordata, which is smooth and polished, well outlined by the crenate lateral furrows and medianly feebly grooved, apex of the area always roundly impressed; mesopleuron rugoso-reticulate, punctures posteriorly sparse, metapleuron and sides of propodeum finely closely striate. Abdominal tergites very sparsely and shallowly punctured and each at base broadly impunctate, on punctured areas intervals much larger than points, punctures on posterior tergites slightly more distinct and gross. Platform on sternite 2 without puncture, pygidial area at base sparsely irregularly punctured, rest of the area feebly wrinkled with surface microscopically coriaceous.

♂. Length 7.2–8.7 mm. Black. Face below antennae including interantennal carina and sides of antennal sockets, clypeus except brownish apical margin, mandibles except apical portion, two spots on pronotum (sometimes lacking), wingtegulae, apex of abdominal tergite 1, apical half of 2 (sometimes carrying two small black spots in it), 3 wholly, apical bands on 4–6 (but no ferruginous areas at all) yellow. Legs yellow with following portions black : front coxae, base of front trochanter, base externally of front femora, basal 2/3 of mid and hind coxae and internal streak on apical half of hind tibiae. Antennae dark brown, beneath browhish, apically darker. Hind tarsi pale brown. Wings slightly clouded, apically darker, veins dark brown, stigma and costa ferruginous.

Head above with OOD = POD, head seen in front : Fig. 60. Supra-clypeal area flattened below and level with face, clypeus gently convex (seen in profile : Fig. 61), the inclination uniformly continued to lateral lobes, apical margin truncate and feebly produced at sides, no fringe of dense hairs on laleral lobes; antennal joint 2 subglobular, 3 somewhat laterally compressed, in the dorsal view 1.7 times, in the posterior view 1.3 times as long as wide at apex, joint 7 as long as wide, terminal joint about 1.5 times as long as joint 3. Structure of pronotum same as in ♀ except that posterior transverse impression medianly irregularly sculptured. Mesonotum, propodeum, tergite 1, sternite 2 and basal lobe of hind wing well agree in structure with those of ♀. Pygidial area : Fig. 62. Face and clypeus microscopically finely punctate and rugulose, with larger punctures sparsely scattered; median lobe of clypeus apically without minute sculpture and shining. Punctures on vertex, mesonotum, propodeum and abdomen very much coarse and everywhere interspace narrower than points; propodeum coarsely subreticulate and partly rugose, punctures clearly outlined and somewhat sparse by the sides of area cordata, which is sculptured as in ♀.

Holotype : ♀, 13. Ⅷ. 1938.

Allotype : ♂, 2. Ⅷ. 1938.

Paratypes : 5 ♀♀. 22, 28. Ⅵ; 18. Ⅶ; 13, 21. Ⅷ. 1938; 1 ♀, 20. Ⅴ. 1939; 2 ♂♂, 16. Ⅵ; 2. Ⅸ. 1938.

Remarks. One of the female paratypes collected in 1939 is aberrant in the colour of the legs. The right mid leg is black from the base to the apex of the femur and the tibia is also somewhat darkened, while the left mid leg is normally yellow. The left hind leg is also black up to the end.

of the tibia (the tibia somewhat ferruginous yellowish) and the right coxa and trochanter are black and the femur is fairly darkened.

5. *Cerceris rubida* (Jurine, 1807)

Philanthus rubidus Jurine, Nouv. Meth. Hym. et Dipt., I, Taf. X, Figs. 2 et 3, 1807.
Cerceris rufinodis Radoszkovsky, Reis. Turkest., p. 56, 1877 (Turkestan).
Cerceris variabilis Radoszkovsky, Ibid., p. 63 (Turkestan).
Cerceris rubida F. Morawitz, Hor. Soc. Ent. Ross., 25, p. 217, 1891 (Astrachan); —— Shestakov, Ann. Mus. Zool. Acad. Sci. Russ., 22, p. 148, 1918 (Turkestan); —— Gussakovskij, Ark. Zool., 27 A, No. 21, p. 13, 1936 (Kansu).

Specimens examined : 4 ♀♀, 14. V; 13, 21. VIII; 2. IX. 1938, 39.

Distribution : Europe, Turkestan (Astrabad, Djisak, Ferghana, Taschkend), Kansu, Peking, Manchuria (Harbin) and E. Mongolia.

Remarks. The maculae on the body are markedly whitish as compared with the European specimens at hand, especially so on the abdomen. Other characters well agree with those of the western specimens. (The maculation on the clypeus is similarly varied, sometimes completely lacking.)

6. *Cerceris bupresticida* Dufour, 1841

Cerceris bupresticida Dufour, Ann. Sci. Nat. Zool. Ser., 2, 15, p. 370, 1841; —— F. Morawitz, Hor. Soc. Ent. Ross., 25, p. 215, 1891 (Astrachan); —— Ibid., 28, p. 351, 1894 (Turkmenia); —— Shestakov., Ann. Mus. Zool. Acad. Sci. Russ., 22, p. 125, 1918 (Turkestan); —— Yasumatsu, Mushi, 14, p. 108, 1942 (N. China).

Specimens examined : 8 ♀♀, 14, 20. V; 3, 5. VII. 1938, 39.

Distribution : Europe, W. Asia, Turkestan, China (Astrachan and Peking).

Remarks. There is no particular geographical character in the form, sculpture and coloration in the specimens above listed.

7. *Cerceris bicincta* (Klug, 1835)

Synonymy : See p. 41.

Specimens : 2 ♀♀, 20. V, 4. VII. 1938.

Distribution : Europe, N. Africa, Asia Minor, N. China, Korea, Manchuria.

8. *Cerceris albofasciata* (Rossi, 1790)

Synonymy and distribution : See p. 41.

Specimens examined : 9 ♀♀ 1 ♂, 3, 16, 22. VI; 18, 26. VII; 1, 13. VIII. 1938, 39.

9. *Cerceris arenaria* (Linné, 1758)

Cerceris arenaria Schletterer, 1887, p. 413 (incl. Turkestan); —— F. Morawitz, 1894, l. c., p. 353 (Cheirabad); —— Shestakov, 1918, l. c., p. 124 (Turkestan)
Cerceris quinquecincta Ashmead, 1904, p. 66; —— Sato, 1927, p. 97 and the Japanese authors. (See also p. 26, 41.)

Specimens examined : 3 ♂♂, 22. VI; 4. VII; 1. VIII. 1938.

Remarks. The specimens are similar in structural and colorific characters to those of Europe. Generally, however, the blackish maculae on the legs seem to be much paler in the Chinese specimens; more often they turn into ferruginous coloration.

10. *Cerceris falcifera* sp. nov.

This species is somewhat similar in the form of the clypeus to *C. hokkanzana* m., but differs from it in the slender body, finer and sparser punctuation and also in coloration. The appendix of the clypeus of this species seems to resemble that of *C. semilunata* Rad., but this species is much smaller and with completely different coloration at least.

♀. Length 9.5–10.0 mm. Black. Mandibles except apex, lateral lobes at base and appendix of clypeus except narrow fringe, two lateral maculae on face, a spot behind eye, two spots on pronotum and a transverse macula on each side of abdominal tergites 2–5 (sometimes becoming a medianly attenuate band) white. Antennae beneath (above dark brown), wingtegulae, postscutellum, basal three segments and sternite 4 of abdomen and legs (except front and mid coxae, base of front trochanters and of hind coxae) ferruginous. Wings slightly fuscous, apically darker, costa and stigma light brown.

On vertex OOD : POD = 3 : 2, head seen in front with inner margins of eyes nearly parallel, appendix raised from base of median lobe, forming an angle of about 30° with the ground surface, seen from above buffalo-horn-shaped (Fig. 63), below the appendix ground part anteriorly markedly convergently produced, the sides gently carinate with the apical end produced into a short tooth, apical margin between the teeth nearly straight and provided on its dorsal surface with four tubercles or teeth (Fig. 63). Antennal joint 2 globular, 3 slender, rather suddenly incrssate near apex and about 2.3 times as long as broad at apex, joint 8 as long as broad. Pronotum anteriorly roundly inclined, with lateral carinae not strong and postero-lateral areas gently roundly incrassate; mesopleuron with longitudinal furrow not carinate on its upper margin. Abdominal segment 1 wider than long, with medio-anterior short carina and ante-apical small impression well defined; sternite 2 without basal platform, pygidial area (Fig. 68) with sides on basal half parallel and apically gently convergnt, apical margin roundly produced and with a small rounded incision in middle, the surface deeply excavated on apical portion, leaving medio-apical area as a broad rounded elevation. Legs normal, not particularly abundantly spinose. Basal lobe of hind wing slightly longer than a quarter of anal cell.

Vertex sparsely scattered with medium-sized punctures, with interspace as large as or larger than points, upper frons more finely closely rugoso-punctate, sides of lower frons and lateral lobes of clypeus finely rugoso-punctate, appendix rather sparsely and somewhat coarsely punctured, median lobe below appendix impunctate and polished, with sides arcuately, not strongly striate. Punctures on pronotum sparse and fine, on mesonotum as on vertex, with microscopic minute points scattered between, on propodeum medium-sized, rounded, sparse, with intervals on an average larger than points and also scattered with minute points. Area cordata smooth and polished. Punctures on tergites finer than on propodeum, rounded and distinct and everywhere sparse (with intervals usually 2–4 times as large as the points. Pygidial area transversely rugose, the rugae apically and basally indistinct. Sternies, each with not well outlined punctures on latero-apical portions. Body sparsely covered with long pale brownish pubescence, on ante-apical margin of clypeus with a few stiff hairs towards sides.

♂. Length 7.5–8.5 mm. Black. Face below antennae, clypeus except apical margin, basal 2/3 of mandibles, antennal joint 1 wholly, a spot behind eye, two large maculae on pronotum, tegulae, two spots on scutellum, postscutellum, apical margin of abdominal tergites 1–6, latero-posterior transverse macula (sometimes a band) on sternites 2–4 and legs except coxae in part orange yellow. Antennal flagella beneath (above broadly dark brown) and abdominal segments 1–2 ferruginous or yellowish red. Wings clouded as in ♀, hind tarsi brownish towards apex.

Head seen in front : Fig. 64, interantennal carina short, broadened downwards and gradually turning into supra-clypeal area, median lobe of clypeus glossy (more glossy than lateral lobes and face), sparsely punctured, its surface gently convex, with apical portion laterally inclined, appearing bluntly raised in the medial line, apex distinctly tridentate. Clypeus seen in profile : Fig. 65. Relative length of

the antennal joints as in ♀, the form of joints 2 and 3 also as in ♀, end joint (Fig. 66) very slightly longer than penultimate joint and gently bent, joints 4–13 beneath gently roundly produced, but smoothed and tuberculate area defined on apical two joints only. Basal lobe of hind wing slightly larger than 1/4 the length of anal cell but not attaining 1/3. Pygidial area (Fig. 67) with apex less strongly incised in middle, the surface impressed at apex but not medianly elevated, at base glossy and towards middle minutely coriaceous, and scattered sparsely with coarse punctures all over. punctuation of propodeum generally similar to ♀, but punctures sparser, with more abundant microscopic punctules scattered between, lateral areas of dorsal aspect and sides of the segment transversely rugoso-punctate. Tergite 1 as in ♀. Long hairs on sternite 6 as in *arenaria*, sparse and somewhat closer laterally, fringe of hairs of 7 dense, very short, appressed and bending inwards, somewhat similar to *arenaria*, but very much shorter.

Holotype : ♀, 22. Ⅵ. 1938, Tiendang, Peking, K. Tsuneki leg.
Allotype : ♂, 22. Ⅵ. 1938, ibid.
Paratypes : 1 ♀ 1 ♂, 22. Ⅵ, 6. Ⅶ, 1938, ibid.

11. *Cerceris tiendang* sp. nov.

This species belongs to the group of *coreensis*, it is without the platform at the base of the 2nd abdominal sternite, with a small tooth (not so marked) on mesopleuron below and characteristic in having the clypeus hemispherically swollen on the median lobe and the wings strongly clouded.

♀. Length 9.5 mm. Black. Lateral maculae on face, a spot behind eye, tegulae, postscutellum, a trausverse lateral macula on each side at apex of abdominal tergites 2–4 white. A spot on antennal scape, two maculae on pronotum and two maculae on tergite 5 dark brownish. Mandibles except apex, antennal flagella beneath on basal half and on terminal joint, abdominal segments 1 and 2 wholly, 3 beneath and sides, legs except front and mid coxae, front trochanters, base of front femora and base of hind coxae ferruginous. Antennae above dark brown. Wings dark brown, darker than in *bicincta*, radial cell and its external area more strongly clouded.

On vertex ratio of OOD : POD = 11 : 10, head seen in front : Fig. 69, median lobe nearly wholly swollen into a hemispherical elevation, (Fig. 70) and medianly above weakly carinate, lower surface narrowly flattened (slightly transversely excavated), apical margin of the ground part gently roundly produced, 6-dentate, 2 lateral teeth small and short, median 4 uniform, nearly equidistant, stout, carinate above, but only shortly produced beyond apical margin, intervals between the carinae deeply roundly excavated; just befor the teeth raised transversely a feeble carina supporting a row of long stiff hairs. Antennal joint 2 globular, slightly longer than wide, 3 nearly 2.5 times as long as wide at apex and slightly more than 4/3 the length of 4, joints at apical portion slightly longer than wide in the dorsal view, end joint nearly as long as joint 3. Pronotum incrassate on postero-lateral areas, with anterior slope steep and laterally above transversely ridged, the ridge extends downwards into the acute propleural carina. On mesopleuron upper episternum above the longitudinal furrow rounded, not carinate on the border along the furrow, lower part of episternum with a small tooth standing on a junction of rugose carinae, not distinct from side, but clear from behind. Tergite 1 nearly semicircular seen from above, with a well-defined ante-apical rounded impression and a medio-anterior short carina, median keel on sternite 1 sinuate, S-shaped in the lateral view, sternite 2 without basal platform, sternite 6 not excavated in middle, normally incrassate on each side, without lateral teeth. Pygidial area : Fig. 71. Sternite 6 : Fig. 72, basal lobe of hind wing nearly a quarter of anal cell.

Vertex and sides of upper frons punctate-subreticulate with medium-sized, on one side shallowed punctures, upper frons in front of median ocellus closely rugoso-striate, sides of face and lateral lobes of clypeus duplicately punctured, larger punctures deep but indistinct on the outline and micropunctules

very abundant, elevation of medial lobe at base duplicately, other parts only coarsely punctured, punctures irregular in shape, lower flattened area smooth and polished. Apical margin of lateral lobes fringed with comparatively long ferruginous hairs. Punctures on mesonotum comparatively large, larger than on vertex and pronotum, and each posteriorly shallower, with intervals less than as large as punctures and scattered with only a few micropoints. Propodeum reticulate, posteriorly and laterally somewhat rugosely so, area cordata with distinct median furrow, longitudinally, slightly obliquely, strongly rugoso-striate, mesopleuron coarsely rugoso-punctate, with ground surface microscopically rugulose and completely opaque; metapleuron and sides of propodeum with similar ground sculpture, the formeer longitudinally closely striate and the latter weakly reticulate. Tergites 1–3 subreticulate, punctures mediocre and on basal and apical portion sparse, on 4 sparser with intervals as large as or partly larger than points. Sternites latero-posteriorly coarsely but not strongly punctured, punctures not distinct on outline.

♂. The structural characters except the secondary sexual ones as well as the sculpture of the body well agree with those of ♀, but the colour of the abdomen and the legs is so different that the specimen is combined with ♀ above described with some querry.

Length 8.3 mm. Black, with the following portions cream yellow : Mandibles except apex, clypeus except apical margin of median lobe, face, interantennal carina, a spot behind eye, two large maculae on pronotum, tegulae, two latero-anterior spots on scutellum, postscutellum, two very large maculae on propodeum, medianly interrupted apical band on tergite 1, medianly attenuate bands on 2–6, side of sternites 2–5, front legs except coxae, a spot on outer face of trochanters and base externally of femora, mid legs except base of coxae, an irregular-shaped macula at base externally of femora and tibiae in front. Antennae dark brown, beneath ferruginous, apically darker. Wings slightly clouded and apically dark brown, veins brown, costa and stima ferruginous, hind tarsi brown, apically darker.

Head seen in front (Fig. 73) with inner margins of eyes subparallel, only slightly divergent from the base of median lobe of clypeus forwards, median lobe gently elevated at base and at sides but broadly flattened on the disc, apical margin feebly and bluntly quadridentate, intervallic space between the teeth slightly impressed (similar in structural pattern to ♀), dense fringe of hairs on lateral lobes convergent apically. On vertex ratio of OOD : POD = 12 : 9. Antennal joint 3 about 2.5 times as long as broad at apex (ratio 13 : 5), subsequent joints progressively reducing in length, joint 7 1.5-times as long as wide, even joint 12 longer than wide, end joint slightly longer than penultimate joint, strongly curved, with a few comparatively long hairs beneath near apex, apical three joints (Fig. 74) beneath provided each with an elongate tubercle where the surface smoothed and polished. Pronotum structured as in ♀, but relatively slightly longer, mesopleuron without the tooth. Tergite 1 as in ♀, pygidial area : Fig. 75, sternite 6 (Fig. 76) provided with a tuft of long hairs on each side before apex which bundled as if glued together, at first bent inwards and then outwards, apical margin of sternite 7 fringed with comparatively long hairs, not so dense as in *arenaria*, but curved as in this, structure of metasternum as in ♀. Basal lobe of hind wing about 1/4 as long as anal cell. Punctuation of the body including sides of face and lateral lobes of clypeus quite identical with that of ♀, median lobe of clypeus sparsely punctured, without microsculpture and well shining, on medial area widely impunctate, with a small transpraent window before apex.

Holotype : ♀, Tiendang, Peking, 13. Ⅷ. 1938, K. Tsuneki leg.

Allotype : ♂, The same place, 4. Ⅶ. 1938, K. Tsuneki leg.

Remarks. The general structure of the male, especially the structure of the clypeus, closely resembles that of *C. coreensis* ♂, a species closely allied to the present species. This is considered to support the validity of the combination of sexes given in this description.

12. *Cerceris rufipes evecta* Shestakov, 1922 (*conj. nov.*)

Cerceris tuberculata var. *bicornuta* Sickmann (nec Smith, nec Guérin, 1845), Zool. Jahrb., Abt. Syst. 8 (2), p. 204, 1895, (Tientsin).

Cerceris evecta Shestakov, Ann. Mus. Zool. Acad. Sci. Russ., 23, p. 3, 1922 (Tientsin) —— Gussakovskij, Ark. Zool., 30A, 15, p. 15, 1938 (Mongolia, Kansu, Arashan); —— Yasumatsu, Mushi, 14 (2), p. 107, 1942 (Peking).

Specimens examined : 7 ♀♀ 4 ♂♂, 3. 22, 28. Ⅵ; 10, 26. Ⅶ; 1938.

Remarks. There is no doubt that *C. evecta* Shestakov is identical with *C. tuberculata bicornuta* described by Sickmann from Tientsin. His *bicornuta*, however, is considered not identical with *bicornuta* Sm. (nec Guérin, = *smithi* Dalla Torre, 1890) because they are different not only in the body size but also in maculation. (*C. bicornuta* may be a species close to *C. pedetes* Kohl, so far as the description is concerned; however, it differs also from the latter.) But to me it seems correct that he conjugated his *bicornuta* (= *evecta* Shest.) with *tuberculata* Villers (= *rufipes* Fabricius ..... See Beaumont, 1950 a and 1950 e), because *evecta* Shest., which was originally described basing on the female specimen only, possesses in both the male and female every character essential to *rufipes*. It differs only in the form of the clypeal appendix and somewhat in colour. The appendix is much shorter and broader (nearly twice as wide as long) with the sides parallel and deeply emarginate in the middle from in front so as to form the two-horned appearance (Fig. 77). Sickmann (1895) and Beaumont (1950 a) already pointed out that the form of the clypeal appendix is not always constant in this species, it tends to broaden and to be incised at the apex as the locality of the specimen goes eastwards. Probably *evecta* is a form representing an extreme phase of such a modefication.

The specimens from Peking are more strongly orange in colour and the bands on the abdomen much broader (♀ and ♂), especially in the female the bands on the abdominal segments 2 and 3 (except the intervallic constriction) occupy almost whole the area. They are, however, closer to the European representative as compared with those from E. Mongolia (p. 63).

The male of this subspecies has been hitherto undescribed. In the structural characters including those of the clypeus and the mid legs it well coincides with the European specimens excepting that of the antenna. In this subspecies the antennal joints are from joint 4 apically relatively shorter. Joint 4 1.5-times as long as wide at apex and the ultimate joint 1.7 times as long as wide at base (in *rufipes* s. str. 1.8 times and twice respectively). Punctures on abdomen finer and sparser. Pygidial area nearly rectangular, finely coriaceous and basally coarsely and closely, apically sparsely punctured. The colour of the flagellum is markedly darker. It is lustreless black entirely except base and apex. The wings are also more strongly brown.

* * *

Besides the above, the following species have been recorded from Tientsin by Sickmann (l.c.) :

13. *Cerceris solskyi* Radoszkovsky, 1877

Cerceris solsbyi Radoszkovsky, Reis. Turkest. Mocs. 57, p. 59, 1877; —— Kohl, 1915, p. 124 (incl. syn. *dorsalis* Eversmann. *caspica* Morawitz, *murgabica* Rad. ex. parte); —— Shestakov, 1918, p. 153.

Cerceris caspica F. Morawitz, Hor. Soc. Ent. Ross., 25, p. 213; —— Sickmann, 1895, p. 204 (Tientsin).

14. *Cerceris gibbosa* Sickmann, 1895

Cerceris gibbosa Sickmann, Zool. Jahrb., Abt. Syst., 8 (2), p. 202, 1895. (Tientsin).

V. *CERCERIS* FROM MANCHURIA IN THE COLLECTION OF MR. P. M. F. VERHOEFF (Holland)

The specimens treated in the present chapter were all collected in Harbin by W. Alin and are now the properties of Mr. P. M. F. Verhoeff, den Dolder, Netherlands. That I had fortunately a chance to investigate these interesting specimens in comparison with those from the adjacent regions of Manchuria depends entirely upon the possesser's goodwill. I wish to express here again my heartiest thanks for his friendship.

The material consists of 67 specimens and comprises 17 species. As the region has remained quite unexplored all of the species discovered are, of course, new to the fauna and, moreover, these involve five species and one subspecies which are probably new to science*. The faunal constitution inferred from the material seems especially of interest when it is compared with the several reports published by F. Morawitz, F.F. Kohl (incl. correction of Radoszkovsky's papers), A. Shestakov and V. Gussakovskij basing upon the collections from the wide central desert regions of Asia made by Potanin, Kozlov, Zichy, Przewalski and Hedin. Because but a few species are found common to them and the present collection, except those that have a wide distribution. This informs us that these regions are rich in the fauna of *Cerceris* and probably in turn that the speciation is actively carried out through the various sorts of barrier other than sea.

1. *Cerceris pekingensis alini* subsp. nov.

The example belongs to the group of *rybyensis* and completely agrees in structural characters with *pekingensis* described elsewhere in this paper. But it differs from it markedly in colour :

Pronotum entirely black, abdominal tergite 1 apically, 2 and 3 wholly yellowish red, yellow band on abdmen developed only on apical half of tergite 3 and legs more broadly black : Front legs up to beyond middle of femora, mid legs up to trochanters and on basal half of femora externally, hind legs up to middle of trochanters, and on femora externally largely. A elongate macula on inside of hind tibiae and hind tarsi brown.

Other maculae as in the typical form. Punctuation also similar. Length 7.5 mm.

Holotype : ♂, Harbin, 6. Ⅶ. 1947, W. Alin leg. (Coll. P. M. F. Verhoeff).

2. *Cerceris sabulosa nupta* Shestakov, 1922 (*conj. nov.*)

Cerceris nupta Shestakov, Ann. Mus. Zool. Acad. Sci. Russ., 23, p. 23, 1922 (Mongolia, Alashan, Gansu sept.); —— Yasumatsu, Mushi, 14 (2), p. 108, 1942 (Mongolia).

Specimens examined : 1 ♀, 10. Ⅶ. 1949; 1 ♀, 16. Ⅸ. 1951; 1 ♂, 6. Ⅶ. 1945.

Remarks. *C. nupta*, except for the difference in coloration, well agrees in the characters of structure and sculpture with *C. sabulosa* Panzer (= *emarginata* Pz.). It was sunk, therefore, to a subspecies of this species.

Extention of the reddish colour on the basal portion of the abdomen is markedly varied. In one female specimen it covers over tergite 1 (except the base) 2 and 3, while in the other from

* Some of the species in the collection were represented by the male sex only. Identification of the male without the female is sometimes very difficult, since most of the descriptions of the sex given by the previous authors were made as addition to that of the female and were quite brief and incomplete accordingly. Moreover, the combination of the male with some female is usually difficult without the direct comparison of the examples excepting those well investigated. Therefore, in this study the males to which I could not have a confidence in identification were dealt with provisionally as new.

the apex of 1 to 2, the latter medianly broadly infuscated. Lateral yellow marks on tergite 2 are in one specimen very small and in the other completely absent. Punctuation of the abdomen is somewhat sparser than in the European typical form.

3. *Cerceris harbinensis* sp. nov.

Only a single male specimen was examined. It is very close to *C. sabulosa* Pz. in the structure of the head seen in front, and of the pronotum, in the punctuation of the head and thorax and in the form of the pygidial area. But it differs from it in the antennal joints relatively longer, in the impunctate tegulae, in the much sparser punctuation on the abdomen, in the form of the basal platform of the abdominal sternite 2 and in the less developed maculation of the abdomen.

♂. Length 8.7 mm. Black with the following portions orange yellow : Face below antennae, clypeus except apical margin, mandibles at base externally, a spot on interantennal carina, two small spots on pronotum, a short narrow line on postscutellum, a small macula consisting of two spots fused togerher on tergite 2 at base, narrow band on tergites 3–6, on 3 and 6 slightly broadened laterally and legs except basal portions. Femora externally more or less broadly black, hind tarsi apically brown.

Head from above with the form as in *sabulosa*, OOD : POD = 12 : 8, seen in front with inner orbital lines and the clypeal structure as in *sabulosa*, the former slightly divergent below, antennal joint 3 twice as long as wide at apex in the broadest view, relatively longer than in nominate species. Pronotum postero-laterally not roundly elevated (in this respect different), anteriorly vertically inclined, carinae at antero-lateral corners well-developed, running down on sides of pronotum to lower portion of propleuron; area cordata not particularly roundly elevated. Sternite 2 with platform at base, transversely rectangular, with apex gently roundly produced and reaching about 2/5 of the incrassatte area of the segment. Punctures on medial lobe of clypeus finer and somewhat closer than in nominate species, on abdominal tergite 4 punctures more remote, with intervallic spaces on an average as large as the points. Sternite 2 rugose and punctate, 2–6 on posterior portion punctate, punctures coarse.

Holotype : ♂, Harbin, 23. Ⅶ. 1950, W. Alin leg. (Coll. P. M. F. Verhoeff)

Remarks. In the form of the pronotum and in having the impunctate tegulae of wings this species resembles rather *C. sabulosa dahlbomi* Beaumont than its nominate race. But it differs from that in the punctuation on the abdomen and general colour of the body.

4. *Cerceris rubida* (Jurine, 1807)

References : See p. 49.

Specimens examined : 3 ♂♂, 6. Ⅶ. 1945 ; 1 ♂, 10. Ⅶ. 1949.

Remarks. The median lobe of the clypeus in the specimens is relatively slightly longer as compared with that of the European specimens.

5. *Cerceris verhoeffi* sp. nov.

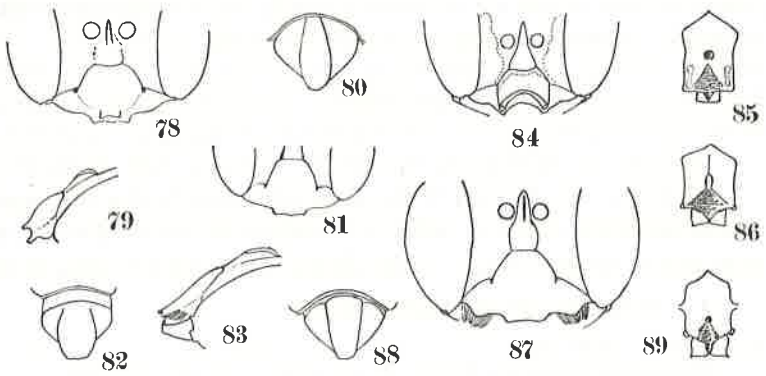
This species belongs without doubt to the group of *rubida*, and seems closest to the Korean species, *koma*, especially in punctuation. But it can be distinguished from *koma* by the clypeus being convex, with the lamella narrower and by the different maculation of the body. It also resembles *rubida* itself considerably closely, especially in coloration. But it is more primitive in the structure of the clypeus and easily separable thereform by the longer antennal joints and by the different punctuation of the body, especially of the area cordata.

♀. Length 8.7 mm. Black. Lateral large maculae on face, three spots on clypeus, mandibles at base externally, wingtegulae in part, medianly attenuate apical narrow band on abdominal tergites 3 and 5, all tibiae in front, hind trochanters and sometimes mid metatarsi also, yellow. Front and mid tarsi

yellowish brown, antennae above, pygidial area apically and hind tarsi brown to dark brown, antennal flagella beneath broadly ferruginous, wings with antero-apical portions markedly clouded.

Head from above with OOD : POD = 13 : 8, seen in front (Fig. 78) with inner orbits of eyes gently divergent below (interocular distance at antennae and at lateral base of clypeus 40 : 43), Seen in profile : Fig. 79; clypeal form generally as in *rubida*, but the median lobe wider and convex, its lamella shorter, narrower, apically not so markedly raised, with apex very slightly emarginate. Antennal joint 3 twice as long as wide at apex, joint 4–7 longer than wide, 8–11 nearly as long as wide, ultimate joint as long as joint 3. Area dorsalis on propodeum convex, with medial longitudinal furrow rather feeble. Abdominal segment 1 slightly longer than wide and from middle apically markedly narrowed posteriorly, apical membraneous margin not erected. Pygidial area : Fig. 80, slightly elongate elliptic in form with apical margin very short. Sternite 2 with the elevated area at base, attaining posteriorly as far as 1/3 of the incrassate area of the segment, but not well outlined on the border. Basal lobe of hind wing about 1/4 as long as anal cell.

Vertex rather sparsely punctured with medium-sized points, upper front more finely closely punctate-striate, lower front sparsely, clypeus much more sparsely punctured with intervals closely covered with minute punctules from which silvery hairs grow, the hairs closer and longer anteriorly. Pronotum practically impunctate, mesonotum finely very sparsely (intervals larger than points), longitudinally very feebly rugoso-punctate, punctures on scutellum and postscutellum slightly larger but similarly sparse, propodeum regularly punctured with medium-sized points which are as large as, or more frequently less than as large as intervallic spaces. Area dorsalis feebly crenate on lateral margins and very finely sparsely punctured on the disc. Abdomen very sparsely punctured, punctures finer than usual, but on tergite 1 largest of all portions of body, from 2 posteriorly progressively smaller and sparser; interspaces everywhere larger than points and again punctured duplicately with very minute points, the points slightly larger and closer on tergite 5, with interspaces microscopically finely coriaceous and the surface of the segment half-mat.



Figs. 78–89. 78–82 : *Cerceris verhoeffi* sp. nov. (78–80. ♀; 81–82, ♂). 83–85, 87, 88 : *C. adelpha* Kohl (84–85, 88, ♀; 83, 87, ♂). 85, 86, 89 : Metasternum (86 : *C. quinquefasciata* Rossi, ♂. 89 : *C. sungari* sp. nov. ♂).

♂. Length 8.3–8.7 mm. In colour similar to ♀, only differing in the following points : Clypeus wholly (except apical margin), interantennal carina, a macula beneath antennal scape, apical margin of tergite 6 instead of 5, front and mid tarsi basally, yellow. Median lobe of clypeus (Fig. 81) similar in outline, but without lamella, apical margin slightly roundly produced, with a feeble protuberance in middle; lateral tufts of hairs not extended to whole the anterior margin of lateral lobes. Inner orbits of eyes slightly roundly produced inwards, but not divergent below, subparallel (rather convergent up to base of median lobe of clypeus), length relation of antennal joints and the structure of area dorsalis as in ♀. Pygidial area : Fig. 82. Basal lobe of hind wing as in ♀. Basal platform of sternite 2 sometimes, feebly bordered posteriorly, varying in extent from 1/4–1/3 of the segment. Punctuation similar to ♀ in pattern, but punctures comparatively larger, with intervals relatively narrower accordingly, on tergite 4

in some part narrower, in others broader than points.

Holotype : ♀, Harbin, 25. Ⅵ. 1950, W. Alin leg. (Coll. P. M. F. Verhoeff)

Allotype : ♂, Ibid. (Ibid.)

Paratypes : 1 ♀ 6 ♂♂, Ibid., the same date (Ibid.)

6. *Cerceris bicincta* Klug, 1835

References : See p. 41.

Specimens examined : 1 ♀, 25. Ⅵ. 1950; 1 ♂, 18. Ⅵ. 1944.

Remarks. In the East-Asiatic specimens the impression on the anterior portion of the clypeus is not so distinct as observed in the European specimens (♀).

7. *Cerceris albofasciata* (Rossi, 1760)

Synonymy and references : See p. 26, 41.

Specimens examined : 1 ♀, 25. Ⅵ. 1950; 1 ♂, 6. Ⅶ. 1950.

8. *Cerceris quadricolor* F. Morawitz, 1889

Cerceris quadricolor Morawitz, Horae Soc. Ent. Ross., 23, p. 158, 1889 (Mongolia, Monasterium Utai); —— Yasumatsu, Mushi, 14 (2), p. 108, 1942 (Mongolia)

Specimens examined : 2 ♀♀, 6. Ⅶ. 1947; 10. Ⅶ. 1949.

Remarks. In the examples above listed the reddish coloration on the abdomen is less developed as compared with the specimens from E. Mongolia. In them the second tergite wholly, apex of the first and the base in part of the third only reddish.

9. *Cerceris adelpha* Kohl, 1887

Cerceris adelpha Kohl, in Schletterer's Palaearctic *Cerceris*, 1887, p. 447 (Korea); Arch. Naturg., Abt. A. 81 (7), p. 107, 1915 (Korea); —— Yasumatsu, Mushi, 14 (2), p. 108, 1942 (Mongolia).

? *Cerceris associa* Kohl, Term. Füzet., 21, p. 348, 1898.

Specimens examined ; 1 ♀, 27. Ⅶ. 1947; 2 ♀♀, 16. Ⅸ. 1951; 1 ♂, 25. Ⅵ. 1950 (*Allotype*); 3 ♂♂, 15. Ⅵ, 1943; 6. Ⅶ. 1945; 10. Ⅶ. 1949 (Paratypes).

The clypeus of the female : Fig. 84, its pygidial area : Fig. 88.

The male of this species has been undescribed.

♂. Length 7.5–9.0 mm. Very closely allied to *5-fasciata* ♂, differeing therefrom :

(1) Face slightly wider, (2) median lobe of clypeus (Fig. 87) relatively broader, with surface more broadly flattened (apically slightly raised —— Fig. 83 —— and with apex truncate), (3) end joint of antennae similar in structure, but hairs beneath longer and less in number, (4) legs more broadly black (outer side of front coxae, trochanters and femora on basal half; base of coxae and base externally of femora of mid legs; apical half of femora, tibiae except in front. Hind tarsi dark brown basally paler), (5) lateral tufts of hairs on sternite 6 similar, but with apex directing latero-anteriorly. (6) The form of metasternum is different (Fig. 85, cf. Fig. 86).

Black. Yellow are : Head in front largely, a small spot behind eye (sometimes lacking), two spots on pronotum, tegulae in part, postscutellum, medianly attenuate apical bands on tergites 2–6. Punctures on median lobe of clypeus sparse, with surface shining, lateral lobes and face not glossy. Punctures on abdomen strong and rather coarse, on tergite 4 punctures larger than intervallic spaces.

10. *Cerceris quinquefasciata seoulensis* Tsuneki

Description : P. 44 of the present paper.

Specimens examined : 2 ♀♀, 6, 27. Ⅶ. 1947; 13 ♂♂, 15. Ⅵ. 1943; 25. Ⅵ. 1950; 6. Ⅶ. 1945, 47, 50; 9. Ⅶ. 1944; 10. Ⅶ. 1949; 16. Ⅸ. 1951.

Remarks. The pygidial area of the Manchurian specimens (♀) is not so elevated as in the Korean specimens, rather close to that of the nominate race. The joints in the middle portion of the antennal flagellum (♂) are slightly longer than in the Korean specimens. In this respect, too, the character is closer to that of the nominate race. But the characters concerning the clypeus (♀♂) which are considered more important are identical with those of the Korean specimens.

In the males of the Manchurian specimens the reddish colour appears frequently on the basal portion of the abdomen. Sometimes the first segment is in part reddish, sometimes the first and the second segment nearly wholly reddish. There are various grades of such a colorific variation. This tendency was already observed on some of the Korean specimens in which the apical portion of the first segment was somewhat reddish.

11. *Cerceris sungari* sp. nov.

Only a single male specimen was examined. It was very closely allied to the male of *C. adelpha* Kohl in the structure, sculpture and coloration. Only the following differences could be observed :

(1) Hairs on the apical fringe of sternte 7 comparatively longer and slightly curved inwards.

(2) Apex of the incrassate area of sternites much more acutely bordered, with postero-lateral angles more distinctly swollen and on sternites 5 and 6 slightly produced posteriorly.

(3) The form of metasternum is different (Fig. 89, *cf.* Fig. 86).

Holotype : ♂, Harbin, 25. Ⅶ. 1950. W. Alin leg. (Coll. P. M. F. Verhoeff)

Remarks. At first it was a difficult problem to determine which of the male groups is the true male of *adelpha* Kohl, but finally it was determined by comparing the form of the metasternum among them.

12. *Cerceris quadrifasciata* (Panzer, 1799)

References : See p. 44.

Specimen : 1 ♂, 10. Ⅶ. 1949.

Distribution : Korea, Manchuria and Europe.

13. *Cerceris pedetes* Kohl, 1887

References : See p. 42.

Specimen : 1 ♀, 16. Ⅸ. 1951.

Remarks. This specimen well agrees in characters with the Japanese specimen with the exception that the punctures on the abdominal tergites are rather sparsely distributed. The body length is also similar, measuring 17 mm. If such is the usual body length of the species here dealt with it becomes slightly larger than that designated in the original description : Magnitudine *C. ferreri* v. d. L.

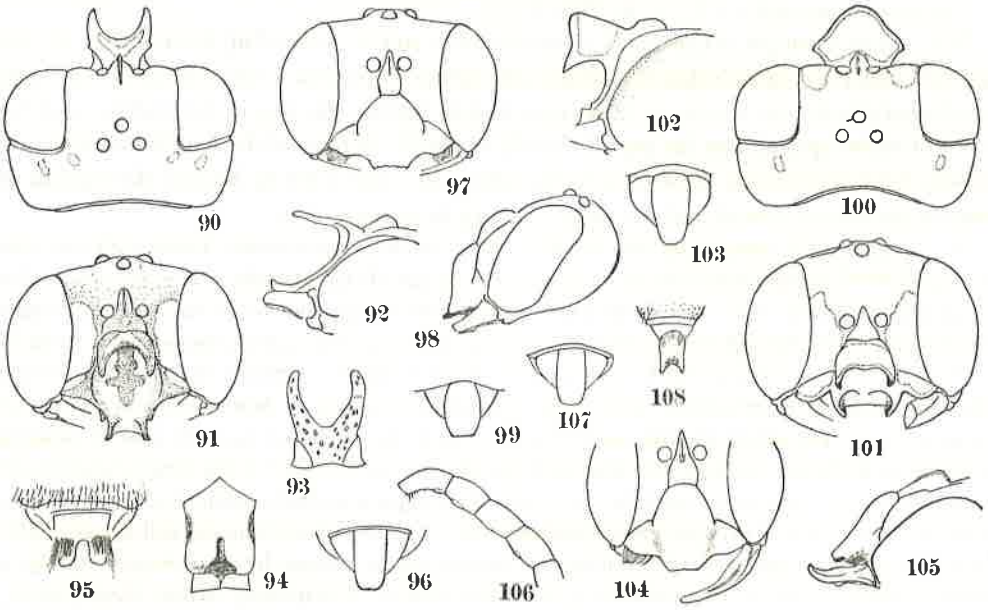
14. *Cerceris lacinia* sp. nov.

The examples of this species has so many corresponding characters, with the exception of the secondary sexual ones, with *C. pedetes* Kohl that I at first inclined to allocate them at the position of the hitherto unknown male of this species. But the comparatively sparser and less strong punctuation of the body as compared with the female made me hesitate to do so, since such is a contrary to the rule found in the male of this genus. Moreover, the male of *pedetes* is supposed to have characters similar to *C. ferreri*, while in the examples the structure of the median lobe of the clypeus was consideradly different from that of *ferreri* ♂, although the pilosity of the abdominal

sternites fairly well corresponded. By such reasons the specimens were treated as a separate species.

♂. Closely resembles *arenaria* L. ♂, but differs from it in the antennal joints slightly longer, median lobe of the clypeus more highly raised and less strongly produced anteriorly in the middle and punctuation of clypeus finer and that of abdomen markedly finer and sparser, and apical fringe of hairs on sternite 7 remarkably sparser.

Length 10.5–12.0 mm. Body covered with long yellowish white pubescence. Black. Yellow are : Head in front below antennae except apical margin of clypeus which is varied from pale yellow to dark brown, basal half of mandibles externally, antennal scape in front, a spot on upper temple behind eye, two large maculae on pronotum, wingtegulae, a touch on upper episternum of mesopleuron, a large transverse macula (sometimes turning into 2 spots) on scutellum, postscutellum, rarely two spots on posterior inclination of propodeum, two lateral maculae on tergite 1, medianly attenuate apical narrow bands on tergites 2–6, similar bands on sternites 2–5, legs except front coxae at base (black), outer base of front femora (black to brown), apical half above of hind femora and hind tibiae externally (testaceous). Antennae ferruginous, joint 1 above, 6–12 above narrowly brown to dark brown. Wings pale flavo-hyaline, costa and stigma pale- and other veins dark-brown.



Figs. 90–108. 90–99 : *Cerceris sibirica* F. Morawitz (90–96, ♀, 97–99, ♂, 92 head in profile, 93 vertical view of clypeal appendix, 94 metasternum, 95 apical sternite). 100–103 : *C. manchuriana* sp. nov., ♀. 104–108 : *C. lacinia* sp. nov., ♂.

Head above with OOD as long as POD, head seen in front : Fig. 104. Clypeus seen in profile : Fig. 105. Antennal joint 3 about 2.5 times as long as wide at apex, joint 8 1.5-times as long as wide, terminal joint (Fig. 106) nearly as long as joint 4. Pronotum almost level with mesonotum, not elevated anywhere, with antero-lateral corners rounded, propleural carinae acute and high. Abdominal tergite 1 nearly as long as wide (dorsal view), with a distinct impression before apex in middle, the spiracles slightly produced as two lateral tubercles. Pygidial area : Fig. 107, sternite 2 without basal platform, sternite 6 without lateral tuft of hairs, 7 deeply roundly emarginate at apex and with a fringe of long

distinct hairs which curve inwards just as in *arenaria*, but very much sparser (Fig. 108), basal lobe of hind wing less than 1/4 as long as anal cell.

Vertex rugoso-reticulate with medium-sized punctures, oculocellar area very sparsely punctured, upper front finely more closely punctate, medianly rugoso-striate. Face and clypeus rather finely sparsely punctured, temples obliquely closely punctate-striate; pro-, mesonotum very sparsely punctured, punctures medium-sized with intervallic spaces larger than points, mesonotum posteriorly closely crenate; scutellum and postscutellum similarly very sparsely punctured, propodeum more coarsely obliquely rugoso-reticulate, area dorsalis strongly closely obliquely striate, on medio-apical portion transversely arcuately striate; mesopleuron rugoso-punctate, metapleuron and lower portions of propodeal sides strongly coarsely striate. Abdominal tergite 1 rather coarsely punctate-reticulate, on 2–5 punctures fine and sparse, always with intervals larger than points, on 6 somewhat large but similarly very sparse. Pygidial area at base sparsely punctured, apically coarsely rugose.

Holotype : ♂, Harbin, 6. Ⅶ. 1947, W. Alin leg. (Coll. P. M. F. Verhoeff)

Paratypes : 8 ♂♂, 25. Ⅵ. 1950; 6. Ⅶ. 1950; 9. Ⅶ. 1944; 10. Ⅶ. 1949.

15. *Cerceris sibirica* F. Morawitz, 1892

Cerceris sibirica F. Morawitz, Horae Soc. Ent. Ross., 26, p. 159, 1892.

Specimens examined : 1 ♀, 6. Ⅶ. 1945; 5 ♂♂.

The female example above listed is considerably smaller than that described in the original paper (18 mm), but as in other characters well agrees with that it was identified with *sibirica*. The original description was an excellent one, as was usually the case in this author, and there is no need of redescription. But the paper is hardly accessible to most of the Asiatic investigators and, morever, there is given no illustration in his paper, so I dared try it, because the capture of this species is the second record and the wasp is a very interesting one.

♀. Length 14.5 mm. Body covered with long yellowish pubescence. Black with the following portions yellow : Lateral large maculae on face, V-shaped macula on appendix of clypeus, two longitudinal maculae connected with each other at the lower ends on the median lobe below the appendix, upper portions of lateral lobes, basal half of mandibles, antennal scapes in front partly, two elongate spots on each side of vertex close to eyes, a spot behind eye, two large triangular maculae on pronotum, wingtegulae in front, a touch on upper area of episternum of mesopleuron, two or three obsolete spots on each side of scutellum, postscutellum wholly, an irregular shaped macula below on each side of posterior inclination of propodeum, medianly attenuate ante-apical band on tergites 1–5 (on 1 interrupted in middle) and postero-lateral maculae on sternites 2–5 which become progressively smaller posteriorly. Legs with femora, tibiae and tarsi of all legs (except basal portions of front and mid femora) and apices of all coxae and hind trochanter in part yellow or ferruginous yellow, other portions black. Antennae wholly, except scapes and pedicels above, and posterior half of wingtegulae ferruginous. Wings flavo-hyaline, apex clouded, veins ferruginous, with subcosta fuscous.

Head seen from above : Fig. 90, OOD : POD : OCD = 20 : 13 : 25, ocellar area slightly elevated, head seen in front : Fig. 91, with inner orbits of eyes markedly divergent below, supra-clypeal area very small, nearly incorporated in the interantennal carina which is comparatively incrassate and medianly acutely carinate, the carina not extending upwards, clypeus with appendix slightly broadened apically (ratio 30 : 35), nearly as long as wide at apex, broadly and deeply emarginate from in front and turning into the shape of scissors (Fig. 93), producing from nearly upper end of median lobe at an angle of about 70° with the ground surface; the portion below the appendix roundly excavated seen in profile (Fig. 92), seen in front it is arcuately margined by a gentle elevation on each side and markedly produced anteriorly, apical margin gently rounded and provided with a stout tooth on each side; on the lateral margin of the

produced portion, slightly behind the apical tooth another but less strong tooth defined, on the surface slightly inside and behind the apical teeth two gentle tubercles present, on the ante-apical curved line involving the tubercle growing a row of long bristles. Antennal joint 3 in the dorsal (narrowest) view 2.6 times as long as wide at apex, remaining joints of flagellum progressively shorter towards apex, all longer than wide, end joint nearly as long as joint 4. Pronotum slightly roundly elevated and separated from the anterior inclination on the antero-lateral areas by the upper extention of propleural carinae which are very acute and markedly high, propleura flattened, mesopleuron above and below the transpleural furrow roundly elevated, not carinated along the furrow, lower portion not dentate, scutellum convex and medianly broadly and gently impressed, postscutellum without median impression. Posterior inclination of propodeum gently rounded, not excavated. Abdominal tergite 1 wider than long, medio-anteriorly slightly raised where markedly angulated in the lateral view, median surface rather flattened with a distinct ante-apical impression. Pygidial area : Fig. 96, with surface gently convex, with lateral margins distinctly carinated. Sternite of metathorax : Fig. 94, sternite 2 of abdomen without platform, sternite 6 : Fig. 95, basal lobe of hind wing less than 1/4 as long as anal cell.

Vertex strongly punctured on OOL, behind ocellar region intervallic spaces larger than points, upper front longitudinally finely closely rugoso-punctate-striate, sides of face duplicately not strongly punctate, appendix very sparsely scattered with elongate strong punctures, median lobe below the appendix medianly broadly polished, from upper portion to the sides arcuately closely striate, lateral lobes finely but distinctly and closely punctured. Pro-, mesonotum and scutellum sparsely punctured, punctures medium-sized with interspaces larger than points and scattered with micropoints, posterior margin of mesonotum rugoso-punctate. On propodeum punctures as large as those on mesonotum, with intervals as large as or larger than points and also duplicated with micropoints, area cordata obliquely, on medio-posterior portion transversely striate, striae generally weak, not uniform in strength and partly obsolete. On abdominal tergites punctures fine (except 1) and very sparse and similarly duplicated by micropoints, on tergite 4 intervals 3–10 times as large as points. Pygidial area irregularly finely closely rugulose.

♂. (Hitherto undescribed) 10.5–11.3 mm. Black with yellow : Face below antennae except apical margin of clypeus, mandibles except apex and inner margin, antennal joints 1 and 2 except dorsal brownish spot, 3 on anterior side, a small spot behind eye, two large maculae on pronotum, tegulae, a touch on scutellum (sometimes lacking), postscutellum wholly, a broad ante-apical band on tergites 2 and 3 (occupying 3/4–2/3 of the segment), a medianly attenuating narrow band on tergites 4–6, a similar band on sternites 2, 3 (broad) and 4 (narrow), sometimes lateral maculae on 5; front legs except coxae, posterior face of trochanters and femora, mid legs from apex of coxae wholly, hind legs except extreme base of coxae. All tarsi apically somewhat brownish. Antennae ferruginous except joints 6–12 above where brown to dark brown. Wings somewhat flavescent and slightly dark, with antero-distal portions more or less markedly clouded. Hairs on head, thorax and abdominal segments 1 and 5–7 long and yellowish. Fringe of hairs on apical margin of sternite 7 long, dense and curved inwards just as in *arenaria*.

Head from above with ocellar region markedly elevated, with OOD : POD : OCD = 12 : 12 : 14, occipital margin carinate, head seen in front (Fig. 97) with inner margins of eyes gently divergent below, interocular distance at antennae and at lateral base of clypeus 40 : 45, median lobe of clypeus strongly convex, highest at about 1/3 from base (Fig. 98) and slightly raised at apex, apex bluntly tridentate. Mandibles with a triangular semitransparent protuberance on extero-posterior margin. Antennal joint 3 in the narrowest view 2.5 times as long as wide at apex, each joint more or less longer than wide, terminal joint narrow, very slightly curved, as long as penultimate joint, joints 7–13 beneath carinated, on apical three especially marked. Pronotum gently roundly inclined anteriorly, without the vertical area, constrictions between pro-, mesonotum, scutellum and postscutellum feeble and each portion not strongly

convex, propleural carina distinct and high only on upper portion, structure of mesopleuron as in ♀, propodeum on poserior inclination flattened, with median broad furrow slightly more marked than in♀. Abdominal tergite as in ♀. Pygidial area : Fig. 99. Legs normal, basal lobe of hind wing approximately 1/4 as long as anal cell. Punctuation similar in general to that of ♀, but punctures comparatively smaller, not duplicated by the micropoints, on median lobe of clypeus very sparse and somewhat coarse, on mesonotum on the disc interspaces larger than points, on periferal areas closer and finer. Sculpture on propodeum variable, sometimes finely subreticulate and partly rugoso-reticulate, sometimes wholly obliquely rugoso-striate with indistinct scattered punctures, on area dorsalis also variable, in the allotype wholly longitudinally irregularly feebly striate, in others sometimes rugae defined only on periferal regions with or without fine punctures accompanied, sometimes nearly wholly without striae, in all the cases surface microscopically finely coriaceous and not glossy. Punctures on tergites (except 1) fine and very sparse (intervallic space 4–5 times as large as points). Pygidial area distinctly but sparsely punctured.

Allotype : ♂, Harbin, 10. Ⅶ. 1940, W. Alin leg. (Coll. P. M. F. Verhoeff)

Paratypes : 4 ♂♂, 25. Ⅵ. 1950; 29. Ⅶ. 1946 (Ibid.)

16. *Cerceris manchuriana* sp. nov.

This species is considered closest to *Cerceris sirdariensis* (Radoszkovsky) Shestakov (1918) (nec *sirdariensis* (Radoszkovsky) Kohl, 1915), but differs from it in having the body much more finely and sparsely punctured. Moreover, it has further characters in that (2) the area cordata of the propodeum longitudinally striate, (3) the propodeum wholly immaculated and (4) the clypeal appendix more developed and relatively much longer.

The two species above mentioned are near relatives of *C. ruficornis* Fabr. (= *labiata* auct., = *cunicularia* Schrank) but with the appendix of the clypeus much more strikingly developed.

♀. Length 12.5–13.0 mm. Black. Mandibles broadly, except apex and inner and outer margins, appendix of clypeus broadly except narrow marginal area, upper half of lateral lobes of clypeus, lateral large maculae on face, a spot behind eye, two lateral spots on pronotum, wingtegulae externally, postscutellum, medianly interrupted or attenuate bands on tergites 1–5, yellowish white. Legs reddish yellow variegated with pure yellow except coxae, front (wholly) and mid (partly) trochanters and base of front and mid femora. Antennae beneath ferruginous, above dark brown. Wings flavo-hyaline, apically darkened, veins brown to dark brown.

Head from above : Fig. 100, with OOD : POD : OCD = 16 : 13 : 20, seen in front (slightly obliquely) : Fig. 101, with inner margins of eyes distinctly divergent below, interocular ratio at antennae and at upper lateral corners of clypeus 52 : 60, clypeal appendix (Figs. 100, 101 and 102) semi-cylindric, seen vertically from above slightly wider at apex than at base and slightly wider than long, with apical margin gently bisinuate, in the lateral view with upper surface producing at a wider angle with the ground level of face than in *ruficornis* (Fig. 102), median lobe below the appendix gently excavated, with apical portion not strongly produced anteriorly, apical margin truncate and bordered on both ends by a short but strong carina producing obliquely inwards into a stout tooth (Fig. 101), ante-apical bristle line slightly elevated, broadly opened V-shaped, with arms curved upwards. Antennal joint 3 in the narrowest view 2.7 times as long as wide at apex, joint 7 as long as wide, joints 8–11 wider than long, end joint as long as joint 5. Pronotum not elevated on postero-lateral areas, antero-lateral corners rounded and anteriorly roundly inclined, propleural carinae feeble. Posterior aspect of propodeum flattened and medianly feebly grooved. Tergite 1 wider than long, medio-anterioriorly raised (well defined in the lateral view) and with a distinct ante-apical impression. Pygidial area : Fig. 103, basal lobe of hind wing slightly less than 1/3 as long as anal cell.

Vertex rather finely, moderately closely punctured, punctures not strong, not well outlined, upper

front finely closely irregularly rugoso-punctate, lower front (face) very finely rugulose, punctures on appendix large, longitudinally elongate, not well outlined and sparse, the area below appendix smooth and polished. Mesonotum finely closely somewhat longitudinally rugoso-punctate, punctures irregular in size and each shallowed posteriorly, on posterior margin punctate-striate; scutellum anteriorly closely posteriorly sparsely punctured, propodeum with punctures generally fine but irregular in size and form, not well outlined and fairly close, posteriorly and laterally rugoso-striate, intervals with microrugae and the surface dull and opaque, area dorsalis longitudinally distinctly coarsely striate with median furrow not defined; mesopleuron feebly irregularly rather indistinctly punctured, intervals with microrugae, posteriorly longitudinally rugoso-striate, sides of propodeum finely closely rugoso-striate. Abdominal tergite 1 finely closely somewhat distinctly punctured, with intervallic spaces partly larger than punctures and duplicated with micropoints, punctures on tergite 2 finer than on 1 and fairly close, not uniform in size and having interspaces as large as or partly larger than points.

♂. Similar in body length, coloration, punctuation and especially in characters of lateral tufts of hairs to *C. ruficornis* F. as is the case in ♀, but distinguished from it by the following points :

1) Antennal joints much shorter, joint 3 about 2.5 times as long as wide at apex in the narrowest view and as large in length as OOD, joint 7 nearly as long as wide, distal joint nearly as long as joint 3, strongly bent and provided beneath with comparatively long sparse hairs all over (about 13–15 in number), while in *ruficornis* joint 3 about 2.5 times as long as wide at spex, but much longer than OOD, joint 7 about 1.7 times as long as wide, distal joint much shorter than joint 3, curved and provided beneath with about 8–10 hairs mainly beyond middle.

2) Median lobe of clypeus relatively much wider : In this species ratio 22/25, in *ruficornis* 22/30. Seen in profile it is gently convex on upper 3/4 and gently raised apically, in *ruficornis* the surface with supra-clypeal area forming a straight line except apical portion. Apical margin in the present species truncate, in the compared species bluntly tridentate with the median tooth more advanced.

3) Basal lobe of hind wing slightly less than 1/3 as long as anal cell, while in *ruficornis* about 1/4 as long as the cell.

4) Sternite 8 densely covered with pubescence and dull and opaque, in *ruficornis* pubescence very sparse and shining.

5) Apical portion of hind femora and subsequeut tibae and tarsi more markedly brown than in *ruficornis*.

Holotype : ♀, Harbin, 10. Ⅶ. 1949, W. Alin leg. (Coll. P. M. F. Verhoeff)

Allotype : ♂, Harbin, 9. Ⅶ. 1944, W. Alin leg. (Coll. P. M. F. Verhoeff)

Paratype : 1 ♀, 10. Ⅶ. 1949.

Remarks. In the allotype the left antenna and the mid legs are largely lost.

17. *Cerceris rufipes evecta* Shestakov, 1922

References and remarks : See p. 53.

Specimen : 1 ♂, 6. Ⅶ. 1950.

Remarks. In the specimen captured in Harbin the apical bands on the abdominal tergites progressively narrower posteriorly, on tergites 5 and 6 nearly linear. The colour of the maculae and the bands is more strongly orange than in the specimens from Peking.

* * *

Besides the above, two more species have been recorded from S. Manchuria :

Cerceris arenaria Yasumatsu et Narisada, 1935, p. 73 (Dairen).

Cerceris sabulosa subgibbosa (under the name *C. subgibbosa*) Yasumatsu, 1935, p. 15, 25.

VI. *CERCERIS* FROM APAKA, EAST MONGOLIA

Apaka which was usually called Gegen-sum (*sens* the temple of a grand Lama) by the Mongol was situated in about lat. 45° N and long. 116° E in the vast plain of the Mongolian steppe. The hills were scattered hither and thither, frequently forming hilly regions. They were less than 80 m above the level of the ground which were, however, more than 1000 m above the sea level. Between the hills small rain gutters were always developed that were usually without water. After running about for about one kilometer or so they were completely disappeared in the plain. Small shrubs and tall grasses were only found in these gutters. The upper portion of the slopes of such gutters was usually naked and afforded the ground burrowing wasps a favourable place for their nesting. *Cerceris* lived most commonly in such places, especially those facing the south. Female specimens dealt with in this chapter were mainly collected in such gutters and the males on the flowers thereby.

Under the localiy name of Mongolia a considerable number of species of *Cerceris* have hitherto been described. The true localities, however, belong sometimes to Siberia, sometimes to Alashan, Kansu or Turkestan. At any rate, most of them belong to the central region of the Asiatic Continent and the record from the region north of China proper is rather scarce. The record of the species given below, therefore, will be of some interest in the comparison of the species described in the preceding chapter as well as with those reported from the western regions.

1. *Cerceris pekingensis mongolica* subsp. nov.

This subspecies differs from the nominate race in the brighter coloration and in the weaker punctuation :

1. Coloration. ♀. Black. Mandibles except apices, clypeus except apex of median lobe (brown to dark brown), face up to slightly above base of antennae, scape of antennae, a spot (sometimes an irregular-shaped large macula) behind eye, two large maculae on pronotum, tegulae of wings, postscutellum, two very large maculae on propodeum, a spot on upper area of episterum of mesopleuron, pale yellowish ferruginous. Sometimes humeral angles, a spot on lower area of mesopleuron and tow obsolete maculae on scutellum browish or yellowish. Antennae ferruginous above, apically somewhat darker. Abdominal segments 1 (except extreme base) – 4 bright ferruginous, apex of tergites 2–4 and apical half of tergite 5 yellowish. Legs except extreme base of coxae yellow, more or less ferruginous.

♂. Similar to ♀, but ferruginous tint less marked, generally more yellowish. Sometimes s spot behind eye, mesopleural maculae, sometimes maculae on lower portion of mesopleuron markedly lengthened. Abdominal tergite 6 largely and pygidial area at base also yellow. Antennal flagella dark brown, beneath basally ferruginous.

2. Punctuation. ♀. Similar in general pattern to the original race, but sparser and weaker, on mesopleuron interspaces locally larger than points, in stead of punctate-reticulate, on propodeum very distinct, on abdominal tergites 3 and 4 very feeble and sparse. Length 7.5 mm.

♂. Coarser and stronger than in ♀, but less so as compared with ♂♂ of the nominate race. Mesopleuron coarsely rugoso-reticulate, propodeum around area dorsalis sparsely and somewhat grossly punctured, punctures rounded and shallow, but posteriorly and laterally much weaker and rugoso-reticulate to rugose. On abdominal tergite 4 interspaces on an average larger than points.

Holotype : ♀, Apaka, 26. Ⅵ. 1939 K. Tsuneki leg.

Allotype : ♂, Apaka, 12. Ⅶ. 1939, K. Tsuneki leg.

Paratypes : 1 ♀, 28. Ⅵ. 1939; 2 ♂♂, 28. Ⅵ, 12. Ⅶ. 1939, K. Tsuneki leg.

2. *Cerceris sabulosa nupta* Shestakov, 1922

References and remarks : See p. 54.

Spicimens examined : 4 ♀♀, 15, 18, 30. Ⅸ. 1939; 5 ♂♂. 15, 20, 28. Ⅵ. 1939; 1 ♂, M. Ⅸ. 1939.

3. *Cerceris rubida* (Jurine, 1807)

References and remarks : See p. 49.

Specimens : 1 ♀ 1 ♂, 26. Ⅵ. 1939.

4. *Cerceris bicincta* Klug, 1834

References : See p. 41.

Specimens examined : 1 ♀, 28. Ⅵ. 1939; 1 ♂, 12. Ⅷ. 1939.

Remarks. The specimens from Apaka are slightly smaller as compared with those from N. China and Korea.

5. *Cerceris albofasciata* (Rossi, 1790)

References : See p. 41.

Specimens examined : 1 ♀, 15. Ⅸ. 1939; 2 ♂♂, 15. Ⅶ. 1939; 1 ♂, 8. Ⅸ. 1939.

Remarks. No particular geographical variation could be observed except that the body size seemed to be somewhat smaller in general.

6. *Cerceris arenaria apakensis* subsp. nov.

♂. Differing from the nominate race in the following points :

1) Punctuation finer and distinctly sparser. On the central area of mesonotum intervallic spaces as large as points, with micropoints scattered, on propodeum similar to the nominate race in the size of punctures, but not formally reticulate, with more or less intervals, viz. subreticulate. Area cordata medianly deeply furrowed, with disc anteriorly feebly longitudinally striate and posteriorly microscopically coriaceous, lateral furrows strongly crenate, punctures on abdominal tergites distinctly finer, on tergites 3–5 much sparser, intervals nearly as large as points on the central region and sparser towards periferal areas.

2) Coloration similar, but, besides the usual maculae, two spots on vertex, a large irregular-shaped macula on upper area of mesopleuron, axillae and two spots of scutellum and a spot in front of each axilla yellow. The bands on abdomen slightly narrower and segment 1 wholly and base of sternite 2 ferruginous. On legs black portion absent except base of coxae, and the black areas in the nominate race turn into reddish yellow.

Other characters including the pilosity of sternites 6 and 7 well agree with those of *arenaria* s. str.

♀, unknown.

Holotype : ♂, 31. Ⅶ. 1939, K. Tsuneki leg.

Remarks. This species is apparently close to *C. guichardi* Beaumont, 1951, known from Egypt, but differs at least in the punctuation of the body. The example may be the male of a certain valid species of the group of *arenaria*, but so far as the examined characters are concerned I cannot separate it as distinct from the species compared.

7. *Cerceris quadricolor* F. Morawitx, 1889

References : See p. 57.

Specimens examined : 8 ♀♀ 13 ♂♂, 10. 28. Ⅵ; 5, 16, Ⅶ. 1939.

Variation in females :

1) The form of the ante-apical lamella of the clypeus is considerably varied as given in Figs.

109, 110.

2) Coloration : (a) Head in front. In the brightest coloured specimens the following portions are white : Median lobe of clypeus except apical lamella (black), lateral lobes except apical margin narrowly (pale brown), a broad triangular macula on supra-clypeal area, a spot on interantennal carina and two large lateral maculae on face reaching sides of median lobe and sockets of antennae. In the dark coloured form the pattern is similar, but marginal areas of median lobe broadly, and lateral lobes nearly wholly (except a brownish spot on each side) black, two lateral maculae on face much smaller, widely separated from the sides of median lobe and also from the sockets of antennae. (b) Antenna. The brightest : Apical half of flagellum above only dark brown, scapes largely yellowish, the rest ferruginous. The darkest : Scape and pedicels largely black, each with a ferruginous spot in front, flagellum above on apical 2/3 brownish black. (c) Thorax-complex. Pronotal maculae, tegulae and postscutellum always yellowish white. In some specimens, moreover, two maculae on scutellum and two large maculae on propodeum also yellowish white. (d) Abdomen. Tergites 1 and 2 always ferruginous or reddish yellow, 3 sometimes wholly sometimes partly ferruginous, apical yellow band on each tergite sometimes obsolete on tergites 2 and 3 in such specimens in which tergites 1–3 ferruginous or reddish yellow.

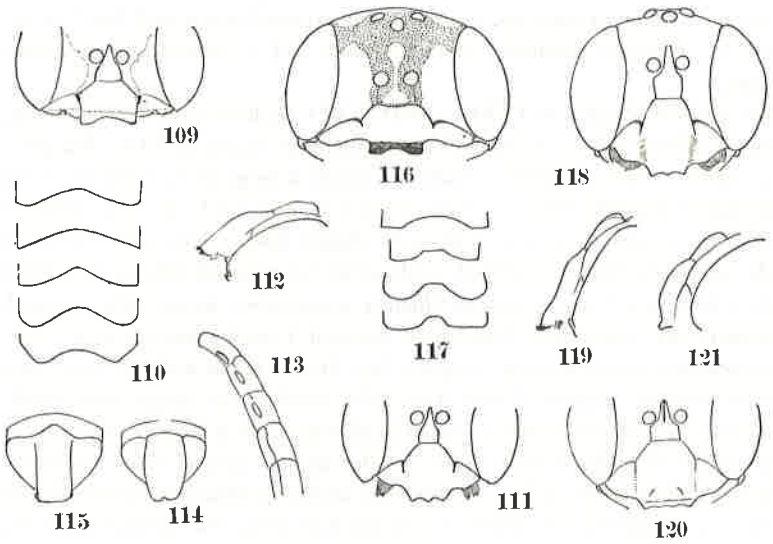
♂. Hitherto undescribed. Closely resembles *C. arenaria* L., differing in the finer and weaker punctuation, in the coloration, especially in the structure of the antennal ioints and in the pilosity of sternite 7. The last mentioned two characters are also the separating keys of this species from the more similar *lacinia* m.

Length 9.0–11.5 mm. Black. Face with sides reaching slihtly above base of antennae, clypeus except apical margin, mandibles except inner margin and apical 2/5, antennal scape in front, a spot behind eye, two large maculae on pronotum, tegulae, a transverse macula on scutellum (sometimes absent), postscutellum, ante-apical band of tergites 2–6 (progressively narrower posteriorly), sternites 2–4 on postero-lateral areas, front and mid legs except coxae, hind legs except coxal base, yellow. Maculae on thorax much whitish and legs with base of front and mid femora, apical portion of hind femora and hind tibiae except front margin more or less ferruginous red, hind tarsi brownish. Apex of tergite 1, base of 2 and 3 broadly, sometimes also of 4 and sternite 1 (on apical half), 2, 3, sometimes also 4, ferruginous red. Antennal flagella with apical half black, beneath ferruginous.

Head from above with ocellar region slightly raised, OOD : POD = 13 : 12, seen in front :Fig. 111, median lobe (Fig. 112) convex as in *arenaria*, with apex distinctly tridentate; mandibles with a broad triangular tooth on lower margin towards middle. Antennal joint 3 in the narrowest view 2.3 times as long as broad at apex, with ratio to joint 4, = 14 : 10, joints of apical portion as long as wide, or in some state appearing slightly longer than wide, apical 5 joints beneath carinated (sometimes well visible on apical 3 or 4 joints only, due to short pubescence), end joint only gently curved, with a few short hairs beneath near apex (Fig. 113). Pronotum transversely roundly raised latero-posteriorly, anteriorly roundly inclined, propleural carinae not strong, posterior inclination of propodeum medianly broadly, in cross section triangularly, grooved. Abdominal tergite 1 with apical impression distinct. Pygidial area : Fig. 114, its variation : Fig. 115, sternite 2 without basal platform. Sternite 7 not only with the apical margin fringed with hairs, but also with whole the surface covered with dense appressed hairs, the hairs on the apical margin curved inwards as in *arenaria*. Basal lobe of hind wing less than 1/3 as long as anal cell. Legs. normal.

Vertex rather closely punctured with medium-sized points, areas outside postocelli impunctate, microscopically finely feebly rugoso-striate, upper front punctate-striate, face closely somewhat rugosely

punctate with irregular-sized punctures, on upper portion finely rugulose, supra-clypeal area with a few large scattered punctures, median lobe of clypeus sparsely and grossly punctured, shining, punctures apically somewhat close, lateral lobes rather finely, more or less closely punctured, with intervals microscopically coriaceous. Pro-, mesonotum and scutellum finely sparsely punctured, with intervals 2–5 times as large as points, shining. Propodeum obliquely finely rugoso-punctate and rugoso-striate, areas close to triangular space less rugose, mesopleuron longitudinally moderately largely rugoso-punctate, metapleuron finely and closely striate. Abdomen finely punctured, on tergite 2 fairly close, on 4 with intervals 2–4 times as large as points. On sternites punctures larger but feeble, on latero-posterior areas of each segment somewhat stronger.



Figs. 109–121. 109–115 : *Cerceris quadricolor* F. Mor. (109–110, ♀; 111–115, ♂; 110 variation in the form of clypeal lamella. 115 rather abnormal form of pygidial area). 116–117 : *C. flava* sp. nov., ♀ (117 variation in the form of the clypeal lamella). 118–119 : *C. gegen* sp. nov., ♂. 120–121 : *C. jakowleffi* Kohl, ♀.

Allotype : ♂, Apaka, 28. Ⅵ. 1939, K. Tsuneki leg.

Paratypes : 12 ♂♂, Apaka, 10–28. Ⅵ, 5. Ⅶ. 1939, K. Tsuneki leg.

8. *Cerceris flava* sp. nov.

♀. Very closely resembles in structure the preceding species, but the median lobe of the clypeus broader, more convex, with ante-apical lamella more raised and, on an average, more deeply emarginate in the middle. Punctuation comparatively larger, closer and stronger, coloration quite otherwise.

The bright coloured specimen : Body and legs yellow, maculated with black as follows : Head and thorax beneath including extreme base of coxae, except 4 spots on mesosternum and 2 spots on metasterum, apex and inner margin of mandibles, lamella of clypeus, a roughly T-shaped macula on front including ocelli and antennal sockets except center of supra-clypeal area, interantennal carina and a spot above it, and occiput, anterior and lateral areas of prothorax, 3 streaks on mesonotum (the middle short), around insertion of wings, narrow marginal lines of scutellum, postscutellum, area dorsalis and a median line of posterior inclination and apex of propodeum, base of abdominal segment 1, intersegmental constrictions and apical segment except sides of pygidial area. Wings hyaline, slightly yellowish, apically clouded.

Dark coloured specimen : Blackish areas of the bright coloured specimen broadly extended and the ground colour becomes black. Yellow are : Basal half of mandibles externally, clypeus except lamella, a spot on supra-clypeal area, on interantennal carina and on upper front, lateral large maculae on face, medianly interrupted transverse band on vertex behind ocelli, a large macula behind eye, two large

maculae on pronotum, short streaks on antero-lateral areas of mesonotum and two spots on it, axillae and a transverse macula on scutellum, postscutellum, two maculae on mesopleuron, a spot on upper region of metapleuron, two large maculae on propodeum, a medianly interrupted ante-apical band on tergites 1–5, those on 1 and 2 broader, a medianly attenuate band on sternites 2–4, a latero-posterior macula on 5 and legs except base of coxae.

Length 13.5–14.0 mm. Head above with ratio of OOD to POD = 18 : 13, head seen in front : Fig. 116, clypeal lamella more strongly raised than in *quadricolor*, considerably varied in form (Fig. 117), anterior margin of ground part with a tooth in middle, mandibles with a large blunt tooth on inner margin toward middle. Antennal joint 3 nearly twice as long as wide at apex (ratio 15 : 7), joints of apical portion nearly as long as wide, in some specimens apparently slightly longer than wide. Pronotum roundly raised latero-posteriorly, anteriorly roundly inclined, without lateral marginal ridges, propleural carinae weak, scutellum shorter, more markedly transverse than in *quadricolor*, propodeum rounded, with posterior inclination flattened, not excavated. Abdominal segment 1 with medio-anterior short carina and medio-posterior rounded impression distinct, slightly less than twice as wide as long (seen from above with anterior surface vertical), Pygidial area with sides parallel, on apical third gently roundly convergent apically, apical margin rounded. Basal lobe of hind wing about a quarter of anal cell.

Vertex fairly closely punctured with medium-sized points, with intervals smaller than punctures, punctures shallowed anteriorly and indistinct on outline, upper front medianly punctate-rugose; clypeus with rather fine punctures sparsely scattered, especially so on median lobe, the surface generally microscopically finely rugulose and dull, lamella smooth and polished. Mesonotum rather closely (intervals smaller than points), scutellum more finely and very sparsely punctured, propodeum subreticulate, partly rugose, punctures on vertex, mesonotum and propodeum similar in size, area cordata medianly grooved and longitudinally feebly striate, the striae not fine, mesopleuron corasely rugosopunctate. Abdominal tergites moderately closely punctured, on anterior and popterior regions of each segment punctures sparser, on tergite 4 with intervals slightly larger than points, on 5 distinctly larger, pygidial area closely irregularly rugose, latero-posterior portions of each sternite coarsely but not strongly punctured.

♂. 9.0–10.5 mm. Very closely resembles the male of C. *quadricolor* except coloration, but distinguished therefrom by the much deeper median furrow on the posterior inclination of the propodeum.

Black. Face with sides up to slightly above base of antennal sockets, clypeus except apical margin, mandibles except apical third and inner margin, a spot behind eye, two large maculae on pronotum, tegulae, postscutellum, ante-apical band on tergites 2–6 and of sternites 2–4 and legs except base of coxae yellow. In one specimen abdominal segments 2 and 3 wholly (except intervallic constriction) and lateral maculae on tergite 1 yellow. Apical portion of hind femora and tibiae reddish yellow. Wings as in ♀, but slightly less yellowish.

Head seen in front including antennae and mandibles with form and structure so similar to that of *C. quadricolor* ♂ that it is hardly possible to distinguish them from each other. Pronotum also similar in structure, sculpture and in maculation. Scutellum, however, medianly markedly and broadly impressed. Propodeum with posterior inclination medianly more deeply excavated. The difference is very marked. Characters of abdomen including hairs on sternites 6 and 7 very similar to those of *quadricolor*. Basal lobe of hind wing as in ♀. Sculpture of propodeum considerably varied, but always falling within the range of variation of *quadricolor*. In one specimen area dorsalis with marginal half longitudinally striate, in the other whole the area, with other portions of the dorsal surface of the segment obliquely finely closely punctate-striate. In one specimen the region adjacent to area dorsalis with punctures sparse and without striae, in the other almost as close and as fine as on the external areas and accompanied with

fine striae. Generally posterior portion more distinctly obliquely striate.

Holotype : ♀, Apaka, 5. Ⅷ. 1939, K. Tsuneki leg.

Allotype : ♂, Apaka, 28. Ⅵ. 1939, K. Tsuneki. leg.

Paratypes : 4 ♀♀, 19, 29, 31. Ⅶ. 1939; 1 ♂, 28. Ⅵ. 1939.

9. *Cerceris gegen* sp. nov.

♂. Very closely allied to the male of *C. ferreri* Linden, differs from it in the coloration and in the structure of some parts of body : Head seen in front relatively longer (ratio of interantennal distance to the length of head below antennae, in *ferreri* 38 : 37, in gegen 37 : 41), median lobe of clypeus also longer accordingly (ratio of width to length in *ferreri* 22 : 27, in *gegen* 21 : 28), face more suddenly elevated above the surface of eye in the lateral view, lateral lobes of clypeus more deeply depressed inwards, pronotum more markedly roundly elevated latero-posteriorly. Punctuation generally coarser and sparser than in the compared species.

Length 9.3–9.5 mm. Black. Mandibles except apex, face from slightly above antennal sockets downwards, clypeus except apical margin, antennal scapes largely, two large maculae on pronotum, postscutellum and two lateral large spots on sternites 2–4 (some times also 5), yellowish white. Medianly attenuate ante-apical band on tergites 2–6, sometimes a small spot on each side of tergite 1 white. Antennal flagella beneath, abdominal segments 1 and 2 wholly, sternite 3 and 4 between whitish maculae, apex of sternites 5 and 6, apical portion of hind femora above and hind tibiae externally ferruginous. Front legs except greater part of coxae, mid legs except base of coxae and hind legs broadly yellow. Antennal flagella above lustreless black, basally brownish, hind tarsi from joint 2 apically dark brown. Wings hyaline, radial cell and its apical portion pale yellowish brown.

Head above with OOD as large as POD, head seen in front : Fig. 118, with border lines between the separate sclerites slightly depressed, thus each area more markedly embossed than in *ferreri*, disc of clypeal median lobe broadly flattened as in compared species (Fig. 119, in the lateral view) with a small semitransparent window down the middle, median tooth on the apical margin feeble, not carinated above. Antennal joints long as in *ferreri*, joint 3 rather abruptly broadened near apex, 2.7 times as long as broad at apex (in the narrowest view), joint 7 as in *ferreri*, 1.7 times as long as broad, structure of joints of the apical portion quite similar to that of *ferreri* (apical joint strongly bent with a few long hairs beneath, a smoothed tubercle defined on three apical joints and a feeble carina on all of the flagellum). Pronotum slightly longer in middle, with anterior inclination somewhat steeper, constriction between this and mesonotum deeper and postero-lateral areas apparently more highly elevated. Other parts of thorax including metathorax as in *ferreri* in structure. Segment 1 of abdomen and pygidial area in structure and sternites 6 and 7 in pilosity as in *ferreri*. Punctuation similar in pattern to the compared species, but comparatively coarser, sparser, especially on thorax. On abdomen punctures similar in size, but sparser, with intervals more shining, on tergite 4 in the middle zone (punctures closest) intervals mostly as large as points, only partly less than so.

Holotype : ♂. Apaka, the last decade of Ⅷ. 1939, K. Tsuneki leg.

Paratype : 1 ♂, Ibid.

Remarks. This species may be a colour variation of *C. pedetes* Kohl ♂ which remains unknown.

10. *Cerceris adelpha* Kohl, 1887

References : See p. 57.

Specimen : 1 ♀, 25. Ⅷ. 1939.

11. *Cerceris jakowleffi* Kohl, 1898

Cerceris Jakowleffi Kohl, Term. Füzet., 21, p. 349, 1898.

This species belongs to the group of *koreensis* and *tiendang*, and is interesting in having the elevation on the median lobe of the clypeus much less developed. This report is probably the second record of capture of this species and, therefore, in order to compare its characters with those of the above mentioned near relatives the redescription was attempted below.

♀. Length 8.5 mm. Black with the following portions ferruginous :

Two lateral maculae on face, upper regions of lateral lobes of clypeus, a vague spot on median lobe, a distinct one on supra-clypeal area, antennae from base to joint 3, joints 4 and 5 beneath and extreme apex, a spot behind eye, two large maculae on pronotum, tegulae, scutellum in middle vaguely, postscutellum, abdominal segments 1–3 except extreme base of tergite 3, an ante-apical broad band on tergite 4, a narrow one on sternite 4, legs except greater part of coxae. Wings slightly fuscous, radial cell and its external area much darker. Head seen in front : Fig. 120, with area round antennal sockets depressed, inter-antennal carina acute, median lobe of clypeus gently roundly convex over whole the area, more gently so than in *tiendang*, with lower portion only flattened (Fig. 121, in the lateral view), anterior margin very short, forming a distinct angle with the lower flattened portion of the rounded elevation, it carries on the surface 6 small tubercles, apical extremity with some thickness and slightly roundly produced seen in front. On vertex POD nearly equal to OOD. Antennal joint 3 about 2.5 times as long as wide at apex. Pronotum with postero-lateral areas markedly roundly exavated as in *tiendang*, a small spiniform tubercle present on lower portion of mesopleuron. Propodeum and metasternum structurally similar to those of *tiendang*. Pygidial area also similar, basal lobe of hind wing much less than 1/3 as long as anal cell.

Face sparsely scattered with medium-sized punctures, with intervallic spaces duplicated with abundant micropoint, opaque, supra-clypeal area and lateral lobes of clypeus very finely closely punctured, the former half-opaque but the latter shining. median lobe glossy and shining. with sparse medium-sized punctures, its upper and lateral areas mixed with abundant micropoints and on the latter a trace of rugosity observable, lower flattened area also finely sparsely punctured. a row of sparse, comparatively short bristles on the lower border of the clypeal elevation. Upper front punctate and striate as in *tiendang*, but vertex much more sparsely and comparatively coarsely punctured, with almost impunctate areas between and outside postocelli. Punctures on dorsal surface of thorax sparse, on mesonotum interspaces very frequently larger than points. Propodeum coarsely, not closely punctured, punctures rounded and partly obliquely confluent, other parts always with more or less interspace between, on posterior portion punctate-striate. Area dorsalis strongly longitudinally striate. Punctures on abdomen fine and very sparse, on tergite 4 interspace on the average 3–4 times as large as points.

Specimen : 1 ♀, 21. IX. 1939.

12. *Cerceris rufipes evecta* Shestakov, 1922

References : See p. 53.

Specimens : 4 ♀♀, 28. VI ; 12. VII ; 22. VIII. 1939; 2 ♂♂, 22. VIII. 1939.

Remarks. The specimens collected at Apaka, E. Mongolia, are characteristic in the broad extention of the ferruginous coloration. In most of the female specimens head is wholly ferruginous, except beneath, with a large black macula on front. Besides the maculae on pronotum and postscutellum, sctellum also always ferruginous, and frequently two large maculae on propodeum present; abdominal segments 1–3 and 4 except base ferruginous (in one exceptional specimen segment 3 dark brown and from 4 apically pitchy black). In the male specimens vertex and temples black,

with a spot behind eye, thorax maculated as in ♀, but always with one or two maculae on upper portion of mesopleuron and two large maculae on propodeum. Abdominal segments 1–3 wholly ferruginous or ferruginous yellow, with intersegmental constrictions brownish, from segment 4 apically each tergite only narrowly black at base. Thus the specimens, together with the structure of the clypeal appendix, are apparently quite different from the nominate race.

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