FAUNISTIC AND SYSTEMATIC STUDIES ON THE SPECIES OF CHRYSIDIDAE (HYMENOPTERA: ACULEATA) IN BİNGÖL PROVINCE OF TURKEY

Mhamad Ali Mahmwd

MASTER'S THESIS

Biology Department

Supervised: Prof. Dr. Abdullah MART

2017

REPUBLIC OF TURKEY

BİNGÖL UNIVERSITY
SCIENCE INSTITUTE

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This dissertation was accepted by the following committee on 19.06.2017 with the vote unity

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Head of examining committee	**Member of examining committee**	**Member of examining committee**

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Director of the institute

PREFACE

Initially, in deep of my heart I thank (Allah) for his benediction who made me able to complete and accomplish this study with fulfillment. I would like to show appreciation my supervisor, Prof. Dr. Abdullah Mart for his patience and guidance throughout this long project.

My gratitude and appreciation are enthusiastic to the presidency of Bingol University, the deanery of College of Biology and to the head of Entomological laboratory of college of Agriculture for their essential facilities thru the exertion (taking picture of specimens).

Private thankfulness to Assoc. Prof. Dr. Mustafa Koyun for his helping and scientific assistances all the way through the period of this work. I am also appreciative to Prof. Dr. Erol Yıldırım for giving chance to look at the Chrysididae species at Atatürk University, Faculty of Agriculture Department of Plant Protection. I express my thanks also to Mr. Yakup Yapar, Mehmet İlkaya, Ramazan Batman, Veysi and Ramazan Oğurtay.

Last of all, I express my sincere gratitude to my family for their support, cheerfulness, patience, and encouragement. Finally, I thank all those who assisted me in doing my work. I dedicate this work to my Family**.**

This study was supported by the project BAP-FEF 2016.00.02. I would like to thank the BAP unit and the staff of Bingöl University.

Mhamad Ali MAHMWD

Bingöl 2017

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF SYMBOLS

LID	:	Leas tinterocular distance.
LLW	:	Length versus width.
MALAR SPACE	:	Shortest distance from eye to mandible base.
MALAR SULCUS	:	Verticalsulcus extending from ocular margin
MIDOCELLAR AREA	:	Area in front of mid ocellus
MIDOCELLAR LID	:	Eyelid-like integumental fold behind mid ocellus.
MOD	:	Middle ocellus diameter.
OMAULUSO	:	Carina originating below pronotal lobe
PD	:	Puncture diameter.
PIT ROW	:	Transverse row of pits located subapically on T-III.
PREOCCIPITAL HOOKP	:	Hook-like beneath head at end of preoccipital carina.
PREOCCIPITAL CARINA	:	Transverse carina or welt located above occiput.
PRONOTAL LENGTH	:	Submedian length of dorsal surface
PROPODEAL ANGLE	:	Lateral hook-like angle or projection of propodeum.
Rs STUB	:	Radial sector when greatly shortened.
S-I-II, ETC	:	Gastral sterna.
S-II SPOTS	:	Two, often large, dark spots on S-II.
SCROBAL CARINA	:	Carina extending along dorsal margin of scrobal sulcus.
SCROBAL SULCUS	:	Longitudinal groove.
SUBANTENNAL SPACES	:	Distance from lowest edge of antennal socket straight.
SUBGENAL AREA	:	Roughly triangular area below genal carina,.
T-I-Il, ETC	:	Gastral terga beginning at the base.
TFC	:	Transverse frontal carina located on or just above brow.
TRANSPLEURAL CARINA	:	Carina extending across metapleuron

BİNGÖL İLİNİNİN CHRYSIDIDAE (HYMENOPTERA: ACULEATA) TÜRLERİ ÜZERİNE FAUNİSTİK VE SİSTEMATİK ÇALIŞMALAR

ÖZET

Araştırma alanı olarak seçilen Bingöl merkez ve ilçeleriden 2016 yılının Nisan ve Ekim ayları arasında toplanan Crysisdidae türleri faunistik açıdan incelenmiştir. Bu çalışmanın sonucunda, Crysididae familyasından 3 alt familya ve 5 cinse ait toplam 23 tür ve 350 örnek incelenmiştir. Literatür araştırmalarına göre, tespit edilen bu türden 22 tanesinin daha önce Bingöl ilinden kayıt edilmediği tespit edilmiştir. Çalışmada tanımlanan her türün kısa ve önemli tanı karakterleri verilmiş ve tanımları örneklerimiz üzerinden yeniden gözden geçirilmiştir. Ayrıca Dünya ve Türkiye yayılışları verilmiştir. Bu türlerden *Chrysis bilobata* Balthasar, 1953, *Chrysis coa* Invrea, 1939 ve *Chrysis rubricata* Mocsary, 1902 Türkiye faunası için yeni kayıttır. Ayrıca, *Chrysis shousboei* Dahlbom, 1854, *Cleptes dahlbomi* Semenov, 1920, *Holopyga ignicollis*, Dahlbom, 1854, *Chrysura anatolica* Trautman, 1926, *Chrysura simplex* (Dahlbom 1854), *Chrysura trimaculata* (Förster, 1853), *Chrysura ignifrons* (Brulle 1833), *Chrysura ciscirtana* Linsenmaier, 1959, *Chrysura pseudodichroa* (Linsenmaier, 1959), *Chrysura baccha* (Balthasar, 1953), *Chrysura laevigata* (Abeille de Perrin, 1897), *Chrysidea pumila* (Bischoff, 1910), *Chrysis cerastes* Abeille 1877, *Chrysis ambigua* (Radoszkowski, 1891), *Chrysis inaequalis* Dahlbom, 1845, *Chrysis concolor* Mocsary, 1893, *Chrysis ragusae* De-stefani, 1888, *Chrysis mirabilis* Radoszkwski, 1876, *Chrysis ciliciensis* Mocsary 1914, ve *Chrysis shousboei* (Dahlbom, 1854) Bingöl ilinden ilk defa kayıt edilmiştir. Sonuç olarak, Türkiye'den bilinen takson sayısı 443 den 446 yükselmiştir.

Anahtar kelimeler: Türkiye, Bingöl, fauna, Hymenoptera, Chrysididae.

FAUNISTIC AND SYSTEMATIC STUDIES ON THE SPECIES OF CHRYSIDIDAE (HYMENOPTERA: ACULETA) IN BİNGÖL PROVINCE OF TURKEY

ABSTRACT

Crysisdidae species collected between April and October of 2016 from the Bingöl centers and provinces selected as research areas were investigated from faunistic point of view. As a result of this study, totally 23 species and 350 specimens have been investigated belonging to 3 subfamily and 5 genera of Crysididae family. According to the literature studies, it was determined that 22 of these species identified were not reported from Bingöl previously. Short and important diagnostic characters belonging to each species identified in the study were given and their definitions were re-examined through our samples. In addition, the distribution of the world and Turkey is given. Among them, *Chrysis bilobata* Balthasar, 1953 *Chrysis coa* Invrea, 1939 and *Chrysis rubricata* Mocsary, 1902 are newly recorded for the Turkish fauna. Separately, *Chrysis shousboei* Dahlbom, 1854, *Cleptes dahlbomi* Semenov, 1920, *Holopyga ignicollis*, Dahlbom, 1854, *Chrysura anatolica* Trautman, 1926, *Chrysura simplex* (Dahlbom 1854), *Chrysura trimaculata* (Förster, 1853), *Chrysura ignifrons* (Brulle 1833), *Chrysura ciscirtana* Linsenmaier, 1959, *Chrysura pseudodichroa* (Linsenmaier, 1959), *Chrysura baccha* (Balthasar, 1953), *Chrysura laevigata* (Abeille de Perrin, 1897), *Chrysidea pumila* (Bischoff, 1910), *Chrysis cerastes* Abeille 1877, *Chrysis ambigua* (Radoszkowski, 1891), *Chrysis inaequalis* Dahlbom, 1845, *Chrysis concolor* Mocsary, 1893, *Chrysis ragusae* De-stefani, 1888, *Chrysis mirabilis* Radoszkwski, 1876, *Chrysis ciliciensis* Mocsary 1914, and *Chrysis shousboei* (Dahlbom, 1854) have been recorded from study area for the first time. The result increase recorded taxa of Turkey from 443 to 446 species.

Keywords: Turkey, Bingöl, fauna, Hymenoptera, Chrysididae.

1. INTRODUCTION

Biological importance is inevitable as Anatolia, which has a continental character in the world, is a shelter for living things affected by geological and climatic changes in the past. Anatolia is a rich biological museum with its inhabitants due to its geographical position and topographical features. The largest and richest group in this biodiversity is insects. Insects make up most of the biological diversity on Earth. They exsist all habitat types and acting major roles in the function and steady of terrestrial and aquatic ecosystems. Insects are close incorporated with our lives and influence the welfare of humankind in various ways.

Simultaneously, large numbers of insect species, including those not known to science, continue to become extinct or eradicate from local habitats worldwide. The members of this group, which are so diverse, have spread to almost every kind of place from equator to poles, from deserts to forests, from high mountainous to plains, from marshes to caves, from cold water springs to hot water springs, from agricultural spots to our homes. The fact that insects can spread to so many different environments and live there is due to the strong ability of adaptation.

Insects have a huge significance because of their ecological role, effect on agriculture, human health, natural resources and diversification. In turning point studies in climate change, developmental biology, biomechanics, ecology, physiology, paleolimnology, and genetics insects have been used. The biological basis for all terrestrial ecosystems formed by insects.They cycle food, provide soil structure and fertility, control populations of other organisms, pollinate plants, spread seeds, and provide a big nourishment foundation for other taxa (Majer 1987). The number of insects described at present is estimated to be 1.004.898 in a total biota described to date of 1.4 to 1.8 million (Foottit and Adler 2009).

Hymenoptera is one of the four major orders of insects, the other three being Coleoptera, Lepidoptera, and Diptera. Each order comprise over 100 000 described species around the world, with Coleoptera having over 300 000. Hymenoptera is one of the most numerous groups of insects, with many members known to everyone. This intimacy is indicated by the regional names given to Hymenoptera that serve, bother, frighten, or hurt people in their daily lives. Some names are bee, ant, wasp, and sawfly. Although a local name like bee or ant may refer to hundreds of species, the bulk of Hymenoptera species go silently about their business unnoticed and nameless (Goulet and Huber 1993).

The order Hymenoptera includes much more and more diverse, species than simply ants, bees and wasps. Paper wasp, potter wasp, yellow jacket, bumblebee, velvet ant, wood wasp, and horntail are other collective names for some hymenopterans. These names have constricted meaning than ‘wasp’ or ‘ant’, but they are still collective names in a single genus for multiple species.

Both extant and exhausted Hymenoptera are classified into two large groups, Symphyta and Apocrita. The Symphyta (sawflies, wood wasps, and horntails) comprise the most primitive hymenopterans and contain about 7% of the Hymenoptera. Most symphytans have a clearly visible, free-living, caterpillar-like larva that feeds on leaves; the comparatively few leaf-mining and stem- and wood-boring species have a more grub-like larva (Foottit and Adler 2009).

The Apocrita include about 93% of the Hymenoptera and are subdivided in to the Aculeata (stinging hymenopterans), which contain close species such as ants, social wasps, and bees, and the Parasitica, a various and plenty group of usually small, uncertain species, most of which parasitize insects and spiders. Because they differ essentially from actual parasites, which consume their entire lives inside or on a host and do not usually kill it, they are better known as parasitoids-insects with free-living adults whose larvae develop alone or collectively on or in a single host individual, finally kill it. The larvae of Aculeata are usually grub like and are not free living (Foottit and Adler 2009).

Described species of Hymenoptera is divided into so many superfamily and family. Chrysidoidea is one of the superfamilies of Hymenoptera. This superfamily consists of

three moderately species rich families (Bethylidae, Chrysididae, and Dryinidae) and four small, rare ones (Embolemidae, Plumariidae, Sclerogibbidae, and Scolebythidae). The majority of these families are highly specialized, and all are parasitoids. A variety of phylogenetic studies have been made of the Aculeata or chrysidoidea specifically (Kimsey and Bohart 1991). The family Chrysididae, generally called cuckoo wasps, contains 87 genera and 2509 species in the world. This family has four Subfamilies (Chrysidinae, Cleptine, Amiseginae, and Lobosceliinae), although some authors regard Parnopinae as a distinct Subfamily (Farhad et al. 2016). Gold wasps or cuckoo wasps are common names frequently applied to the family Chrysididae. Their former is justified by their frequently metallic coloration, and Cleptoparasitic habits refer to the latter. On a sunny day this brilliant aspect is best considered, while the female wasp is searching a nesting site of a favored wasp host. The sunlight reflects from the parasite and appears to accentuate the metallic colors-blue, green, red, copper, purple, brass and gold- in various combinations. Chrysidids are not all brilliant, but most of them are small, the tiny ones often make up for in color what they lack in size (Kimsey and Bohart 1991).

The sight of *Hedychridium* sliding not regularly over the sand like a drop of pure gold never fails to confuse the collector. Most Chrysidids are metallic blue, green, and purple in different combinations in the Western Hemisphere. In the ancient world, especially in the Southern USSR and Africa, these wasps are constantly more colorful. Alone specimen may be blue, purple, green, red, gold, copper; all somewhat shining. These are mixing colors. The true pigment sign of red, brown, and white are not so common; in addition to the often brilliant integument are the numbers of many shapes of tiny impressions or punctures which are about always found. These modify and often improve the coloration. Chrysidids are generally well-considered by collectors to be seldom encountered; yet they can be plentiful. General net-sweeping of grass and low bush, or fields of flowers such as *Eriogonum* (wild buckwheat), will often harvest dozens of specimens, mostly small ones (Kimsey and Bohart 1991).

In recent years trapping has been quite successful. Stick traps, such as those used by Krombein (1967) and Parker and Bohart (1966, 1968), have revised many chrysidids, as well as information on their hosts (Kimsey and Bohart 1991).

In the past few decades flight traps have been used successfully, and especially efficient in collecting males. Chrysidids are distributed world-wide, but have not fully investigated in the Middle East, Southern Asia and Africa. Already only two world revisions have been tried. The old workers were Dahlbom (1854) and Moscary (1889). In retrospect these worthy publications are seen to be fairly lacking. Especially they suffer from the lack of a clear common notion. According to Linsenmaier (1959 a, b) using the European fauna, in this regard was more positive but still quite retiring. None of these three authors acted the Amiseginae or Lobosclidiinae (Kimsey and Bohart 1991).

Even now, these subfamilies of small, mysterious wasps need much more work by systematics. There has been little major reviewed research, despite of the charming nature of these wasps. Faunas of limited geographic regions have been centered by most studies, rather than reviews of specific taxa. At a territorial level many of the features utilized to realize genera, tribes, and subfamilies and are dependable. In this family with homonymy and synonymy there are also earnest issues, particularly for the Western Palearctic fauna. Moreover, no priors work has ever been made of phylogenetic relations with the Chrysididae.

The region has been chosen as a research area in Bingöl because of the absence of any previous studies on the Chrysididae family and its rich ecosystem Figure (3. 1). It is aimed to reveal the Chrysididae (Insecta: Hymenoptera) fauna of Bingöl province and to contribute to the fauna of our country in this study which is done by way of all these data.

2. LITERATURE REVIEW

2.1. Some of the Important Systematic Studies Carried out by Local Researchers on Chrysididae (Insecta: Hymenoptera) Species

Yıldırım and Strumia (2000a) have recorded that *Chrysis valida* Mocsary, 1912 (Hymenoptera Chrysididae) is reported as a species new for Turkey and as new parasitoid of *Gymnomerus laevipes* (Shuckard, 1837) (Hymenoptera, Eumenidae). Hymenoptera Chrysididae found in the Erzurum Region (North- West Turkey).

Yıldırım and Strumia (2000b) gave first list of faunistic data of Cleptinae (Hymenoptera: Chrysididae) of Turkey. Very few records were previously available in the literature for this family from this interesting zoogeographical region. Two species, *Cleptes aerosus* Forster, 1853 and *Cleptes semiaurotus* (Linsnaeus, 1761) are new for Turkey fauna. They states that from 9 species that they reported 2 result new for the Turkish fauna and only is an Anatolian endemism.

Yıldırım and Strumia (2006a), they stated that 61 species and subspecies in seven genera from the subfamily Elampinae have been recorded in Turkey. This investigation is based on material collected from localities in Turkey between 1986 and 2005.

Yıldırım and Strumia (2006b) recorded from the subfamily Chrysidinae 77 species and subspecies in eleven genera have been recorded in Turkey. This investigation is based on material collected between 1987 and 2005 from different localities in Turkey.

Strumia and Yıldırım (2007) recorded on Chrysididae (Hymenoptera, Aculeata) of Turkey are presented. It is based upon material collected from different localities of Turkery between 1992 and 2006.In this paper 203 species and subspecies (47 new for

Turkey) belonging to 20 genera are recorded. Three new species from Central and Eastern Turkey are described: *Holopyga eroli, Chrysis sultanica* and *Chrysis yildirimi*. The authors present also an updated checklist of the Chrysididae fauna of Turkey including 439 species.

Wisniowski and Strumia (2007) recorded Chrysididae from different parts of European and Anatolian Turkey during the years 2000-2005. The collection includes 75 species and 2 subspecies represented by 251 specimens. Two species are for the first time recorded from Turkey.

Strumia and Yıldırım (2011) reported on Chrysididae the result is including the new taxa determined in this scholarship an overall of 443 species and subspecies of the family Chrysididae were documented from Turkey up to now.

2.2. Some of the Important Systematic Studies Carried out by Foreign Researchers on Chrysididae (Insecta: Hymenoptera) Species

Arens (2004a) the 14 species of *Holopyga* hitherto known from Southern Greece are revised; a key for all species is presented. This study are revised from Southern Greece, 14 species of *Holopyga* hitherto. For all the species a key is given by him. Founded on morphometric data and a thorough investigation of other features, especially of the male genital, the previous taxonomical interpretation of the genus could be corrected in some points and two new species are described. *H. amoenula* is considered as a valid species that is dissimilar from *H. generosa.* The latter is obviously represented on the Peloponnese only by the ssp. Virideaurata. For Greece the archives of *H.austrialis* and *H. inflammata* are new.

Arens (2004b) also stated that a third new Chrysidid species from Greece, *Hedychridium aroanium*, is hitherto documented by only one male caught on the peak of the chelmos mountains on the Northern peloponnses. *Chrysis ignicollis* is represented in the Eastern Balkans by a subspecies with sexual dimorphous coloration; its female was hitherto mistaken for *Chr. Angustifrons* female. The latter species obviously does not occur on the Peloponnese. *Hedychridium valesiense* is regarded as a valid species the abdomen of

which, however, has a metallic coloration in the male and a non-metallic in the male. A key for totally *Hedychridium* species known from the Peloponnese is presented.

From Palestine 250 species and forms of Chrysididae are calculated by Linsenmaier 1969. Amid them 11 new ones, for each species its replacement and the distribution of its dissimilar races are represented.

Arens (2002) has taken the golden wasps for *Chr. smyrnensis* and assigned it to five different species. Two of them have hitherto been known merely from Greece; two other groups of specimens have proved to be *Chr. ciliciensis* Mocs. And *Chr. interdichroa* Lins; a fifth species (*Chr. phrygiensis* spec. Nov.) has still been undescribed. The confusion is additionally heightened by strong doubts whether *Chr. smyrnesis* is in fact a valid species the holotype has some characters so in particular it's unusual Ratio of the eye length and the eye distance, it can be suspected that it belongs to *Chr. lydiae* Mocsary.

Morgan (1984) in his great publication states that in Great Britain, Ireland and the Channel Islands there are 11 genera and 33 species, the greatest diversity of species being found in southern England.

The Australian, Oriental and Ethiopian Regions a key is contributed to 32 species of primeuchroeus by Bohart (1988). New species are indiacus from India and 6 species from Australia.

By Linsenmaier (1994b), a completion to *Cleptes* Latrille, 1802, with explosion of two contemporary species is granted, *Cleptes juengeri* and *Cleptes affulgens*.

From the Arabian Peninsula an assessment by Linsenmaier (1994c) is contributed to the family Chrysididae, including keys to the subfamilies, tribes, genera, species-groups and species. Eighty-eight species and 6 subspecies are registered, of which 32 species and 2 subspecies are new to science. Forty species and 5 subspecies are identified solitary from the Arabian Peninsula. Furthermost of the other species are palaearctic in origin (mainly Mediterranean).

In the systematic and circulation a completion is given by Linsenmaier in his booklet in 1997b, with corrections in the synonymy relative this articles, with widespread species, subspecies and sub genera, with remarces to types and lectotypes.

Móczár (1997) in his publishing recounted two species: *Cleptes dauriensis* female from Russia and *C. nyonensis* female from France. The earlier unknown female of *C. anceyi* Buysson, 1891 and male of *C. rugulosus* Linsenmaier, 1968 are pronounced. *C. femoralis* Moscary, 1890 and *C. insidiosus* Buysson, 1891 are reinstated. New data and variability of some species are donated. A key is ended for the 25 species.

A new key by Móczár (1998) is accumulated for subgenera and species groups concerning all presently notorious valid species of the genus *Cleptes* Latreille, 1802. In its place of the lost holotype of *C. putoni* Buysson, 1886 the male (det. Buysson) is indicated as neotype and a female as neotype of *C. dahlbomi* Semenov, 1920. A contemporary subgenus, *Maculosicleptes* subgen. nov. is designated.

On the basis of a huge gathering of gold wasps from Southern Greece there is a modification of the European species of the Chrysis dichroa- group (Subgenus *Chrysogona*) by Arens (2001). He described three new species, two of them appear to inhabit merely higher mountain regions in the South-Eastern Mediterranean, while the third one is wide spread in Southern Greece but exclusively found in spring. New keys make use of these data and a lot of other morphological and biological information.

Schwarz et al. (2003) the type material of the insect collection of the Biology Centre in Linz, Austria is listed. In the first part, which is presented here, 1765 taxa are listed including the references of their first publications.

Two species of the genus *Cleptes* Latreille, 1802: *C. nitidulus* (Fabricius, 1793) and *C. pallipes* Lepeletier, 1806 are newly recorded by Turrisi (2011). From Sicily on the basis of material collected on high altitudes of Enta volcano. The data on the presence of the genus *Cleptes* in Sicily are summarized.

Cleptes hungaricus is described from Hungary by Moczar (2009). A key to the identification of the related species *C. femoralis* Mocsáry, 1890 (Turkey), *C. splendidus* (Fabricius, 1794), *C. maroccanus* Linsenmaier, 1987, *C. nyonensis* Móczár, 1997, and *C. insidiosus* Buysson, 1891 is given with two figures.

In the Southern Greece by Arens (2010b) the *Hedychridium roseum* group is revised. Some misinterpretations could be corrected and a new species is described, from the Peloponnese seven taxa are identified: *H. chloropygum caputaureum* Trautmann 1919, *H. roseum roseum* (Rossi 1790), *H. valesiense valesiense* Linsenmaier 1959, *H. foveofaciale H. caucasium irregulare* Linsenmaier 1959, *H. sculpturatum sculpturatum* (Abeille 1877), and *H. scutellare maculiventre* Linsenmaier 1959. An eighth taxon, *H. insulare insulare* Balthasar 1952 is verified from Northern Greece, but may also occur on the Peloponnese.

In his study, Arens (2011) mentioned that some additions and adjustments of his alteration of the Holopyga species living on the Peloponnes (Arens 2004a) are assumed based on new data material assembled since 2006. Series of *H. ignicollis* and *H. minuma* have made conceivable to verify that the affiliation between eye length and eye distance is actually a well-suited critcrion for distinguishing male of these two species. *H. chrysonata* is characterized by comparatively thick temples, compared with *H. ignicollis*, *H. minuma*, *H. amoenula* and *H. punctatissima.*

So greatly in his publication Arens (2012) mentioned that some *Hedychridium* specimens from Kirgisia and Mongolla could be assigned to four species occurring moreover in Asia Minor and Europe: *H. roseum* (Rossi 1970), *H. sculpturatum* (Abeille 1877) and *H. insulare* Balthasar 1952, and *H. scutellare* (Tournier 1878). The punctuation of the abdomen is uniformly fine in the former two species (similar to European specimens), but coarse in the latter two species (almost identical as in specimens from Asia Minor). The genital of Kirgisian *H. sculpturatum* is deeper indentated as that of European and Turkish specimens.

Currently the family Chrysididae is represented by 32 genera and 428 species in the Ethiopian Region by Madl and Rosa (2012). Several taxonomic changes concerning

combination, status, synonymy and emendation have been proposed. Replacement names are projected for *Chrysis pusilla* Mocsáry 1908 = *Chrysis pusillima* Rosa & Madl new name and *Holopyga capensis* Edney 1940=*Holopyga manuelae* Rosa & Madl current name. *Cephaloparnops* Bischoff 1910 and *Stilbichrysis* Bischoff 1910 are elevated to generic level. A list of doubtful taxa is added.

Rosa and Soon recommended the first checklist of the Iranian Chrysididae in 2013. The list comprises 184 species in 20 genera. Seventy species and genera *Spinolia* Dahlbom, 1854, *Spintharina* Semenov, 1892, *Trichrysis* Lichtenstein, 1876 are recently recorded from Iran. Chronological data with the annotations of current taxonomic location and the precise validity of some species are assumed.

A catalogue of the collection of chrysidids (Hymenoptera, Chrysididae) by Rosa and Pavesi in 2013 housed at the Museo Civico di Storia Naturale of Verona (Italy) and recently studied by the authors is given. 126 species were identified, for a total of about 1.500 specimens. About 1.100 are from Italy, of which more than 700 from Veneto region, including 10 species new to regional fauna. For each species number of specimens and relevant label data are testified, together with systematic, faunal or other notes when appropriate.

An account on the Chrysididae living on the Peloponnese (Southern Greece) is presented in an article by Arens (2014). This first synopsis of the chrysidid fauna of the Greek mainland has consequence from a scheme to record the Peloponnesian Aculeata started in 1995. In the course of this project over 50 locaties from the coastal dunes and the Arcadian basin landscapes up to the tops of the high mountains have been visited several times in spring and summer. As well as ca. 8.300 chrysidids caught by the author, the data of ca. 10.000 specimens assembled by other entomologists in former decades are involved in the report. 190 species of Chrysididae have been registered on the Peloponnese up to now. 11 of them have been undescribed before this current enquiry, 3 have been new for Europe, 19 new for Greece and 4 new for the Peloponnese.

A critical and annotated catalogue of the ninety-six type specimens of Chrysididae (Hymenoptera), belonging to sixty-seven species, housed in the insect collection of Maximilian Spinola is given. by Rosa and Xu in 2015.

From Iran data on the distribution of 52 cuckoo wasp species (Hymenoptera, Chrysididae) are assumed in a publication by Strumia and Fallahzadeh (2015). One genus and 27 species (including 3 new species: 52% of the captured material) are new chronicles for the country. Furthermore, three new species, *Chrysis gianassoi*, *Chrysis majidi* and *Chrysis unirubra* are described and exemplified, and diagnostic characters are provided to identify them. *Chrysis turcica* du Buyson, 1908 is removed from synonymy with *Chrysis peninsularis* du Buysson, 1887. *Chrysis bilobata* Balthasar, 1953 is confirmed as valid species and illustrated. The number of *Chrysis* species in Iran is raised from 62 to 66.

Rosa et al. (2016) recorded great registrations about chrysidid. Two Oriental genera of the tribe *Elampini* (Chrysidinae) are here deliberated. The genus *Holophris* Mocsáry, 1890 is redescribed.

Farhad et al. (2016) reported fourteen species and subspecies in six genera of the family Chrysididae are registered from Hormozgan Province of Iran. Among them, *Hedychridium femoratum* (Dahlbom, 1854); *Hedychridium virescens* (du Buysson, 1908); *Hedychridium verhoeffi* Linsenmaier, 1959; *Holopyga arabica* Linsenmaier, 1994; *Holopyga vicissituda* Linsenmaier, 1994; *Spintharina dubai* Bohart, 1987; *S. integerrima* (Klug, 1845); *Trichrysis scioensis* (Gribodo, 1879); and *T. longispina* (Mocsáry, 1912) are recorded for the first time from Iran. Geographical distributions of all the species and morphological diagnostic characteristics of the newly verified species are momentarily debated. The number of chrysidid species in Iran is now elevated from 194 to 203.
Farzaneh et al. (2017) reported information about the family Chrysididae (Hymenoptera, Chrysidoidea) collected from Fars province, southern Iran. All specimens were collected during years 2013-2014. Twenty eight species, belonging to 12 genera and 2 subfamilies Cleptinae and Chrysidinae were identified and recorded.

2.3. General Informations About Chrysididae

The family Chrysididae is considered to be portion of the Aculeata, or stinging wasps and bees. While Chrysidids have an extremely decrease sting and the terminal abdominal segments are researched. Consequently, an exterior aspect of only 2 to 4 or 5 abdominal segments is formed. In the Aculeata this status is unique. The real number of external segments is a feature of subfamilies and tribes within the Chrysididae. These wasps are the peacocks of the hymenopteran world, rivaled in shine only by the orchid bees (Euglossinae) and some Chalcidoidea. Most species are shinning green, blue, or coppery-red, or fusions of these. The great genus, *Chrysis*, with at least1000 recorded species, almost half the family entire, is familiar commonly as cuckoo wasps in North America or gold wasps in Europe where many species have a coppery-red abdomen (Kimsey and Bohart, 1991).

Most species are parasitoids or cleptoparasitoids in the nests of bees and other wasps, therefore the name ‘cuckoo wasp’. Adults are adaptable of rolling into a ball when the wasp owner of a shelter they enter attempted to sting them. Because they have a hard cuticle and can retreat their antennae and legs closely against the body, the owner cannot sting them but will extract them by the wings and expel them from their burrow, perhaps unhurted. The Amiseginae and Loboscelidiinae parasitize eggs of walking sticks; the Cleptinae parasitize sawfly prepupae. Kimsey and Bohart (1990) reviewed the genera and listed the species. As we introduced overhead, Chrysididae is separated into four subfamilies (subfamily Cleptine, Amiseginae, Loboscelidiine and Chrysidinae) (Kimsey and Bohart 1991).

Upper jaw segmented appendages near the mouth of Chrysididae, usually related to the senses of touch and taste are five-segmented; lips are three- segmented, fully improved and occipital carina ideal. Aedeagus with widely circled apical lobes.
Voleslla with digitus joined on apical half or third of cuspis. Male S-V III with ovoid apex, tightely located medially, with T-formed basic apodeme. Adominal underside bent five exterior segments in males and four in females. Ovipositor robust and unexperted possessed of segments V-IX. Tarsal claws with alone medial or subapical tooth. Fore wing with venation decreased, Rs short, stigma not long and wide without allusion of RI,

discoidal cell not strongly Sclerotizedor totally lost, medial vein turning up at or before cu-a, Rs+ M arising submedially on M 14. Hind wing with short rest of costa, Sub costa, and AI. Propodeum with long dorsal roof and vertical posterior slope laterally angulate to dentate. Metanotum with raised and posteriorly foveate medial roller, two- thirds to one-half scutellar length. Mesopleurson with subalar fossa and scrobal pit, scrobal sulcus and omaulus sometimes existent. Scutum with entire notaui and plates. Prosternum huge and uncovered basically by strongly effective propleura (Kimsey and Bohart, 1991). The second subfamily of Chrysididae is Amiseginae. The Amiseginae are tiny invisible wasps, existed duwn in flora in leaf litter. By the five external abdominal segments in males and four in females they can be known, over and above the flat or concave face, slender mandibles and needle-like ovipositor (Kimsey and Bohart 1991).

These wasps are unusually caught but this is more a reflexion of collecting techniques than of real plenty.The intensity. Species variety exists between latitudes 30 north and 30 south. Amisegines are parasities of phasmatid walking stick eggs (Kimsey and Bohart 1991).

The third Subfamily of it is Loboscelidiine. These uncommon and odd looking wasps are scarcely collected and as a result they are not well-known. The oddly shaped head, anten inserted high on the face, large tegulae, and abdomen with five external segments in males and four in females are so helpful to easily recognize this kind of wasps. They exist in the Indoaustralian Region. The structure of the mandibles and ovipositor suggests that these wasps are also parasites of walking stick eggs (Kimsey and Bohart 1991).

Chrysidinae is one of the subfamilies. This is the huge subfamily of chrysidids in number of species, involving 80 percent of the family. These wasps can be recognized by their shining metallic, coloration (except in a few rare exceptions), and three or least generally four, visual gastra terga, and concave or flat abdominal venter. In all Zoogeagraphic territory members of this subfamily are generally got chance for recording. They are commonly nesting parasites of wasps and bees, though praestochrysis invasives prepual moth larvae. This subfamily separated in to four tribes: Elampini, Chrysidini, Parnopini and Allocoelini.

The Chrysidini is the huge tribe in terms of genera and species. By the existence of a subapical row of pits, or subdued indication of such, across T-III these can be recognizable. Next in size and complexity is the Elampini. There are three visible terga and, for the most portion, dentate tarsal claws. Parnopini is an example smaller group and four terga in males and three in females. T-III is widely rounded and multidenticulate apically. In adittion there are a couple of obliquely oriented discal depressions on the apical tergum (Kimsey and Bohart 1991).

The tribe Parnopini is a tiny group, included of three genera, Parnopes, Cephaloparnops, and Isodelphia. In having four external gastral terga in males and three in females they unsimilar other Chrysidinae, and a huge tegula that covers both wings bases. In the Holartic and Afrotropical Zone this group exists. In this tribe the three genera are neatly related. This has made resolutions with regarding to generic groupings hard. Kimsey (1987) revised the Parnopini and separated it into two genera, Parnopes and Isadelphia, and Parnopes in to two Sub genera, Parnopes S.S and Cephaloparnops, future work of this group indicates that this idea was too preservation, aking parnopes polyphyletic (Kimsey and Bohart 1991).

These taxa are distincted by the modifications of the tongue which are the base diagnostic features. Parnopes S.S and Cephaloparnops have been contemplated are same because both have very long, tubular tongues, unlike Isadelphia. On the other hand, the metanotal projection, propodeal angles, and pronotum indicate a close attachment between Cephaloparnops and Isadelphia. Consequently we are treating each of these three taxa as a separated genus. The Allocoeliini is a tiny Southern African group with dentate tarsal claws but only two visual terga (Kimsey and Bohart 1991).

3. MATERIAL AND METHODS

This thesis is prepared by evaluating the data obtained as a result of two step researches including field study and laboratory study. In order to reveal the faunistic distribution of Chyrisididae family of Bingöl, which was selected as a research area in the field study, samples from different ecosystems included in the province center and districts. Chrysidids were collected by net (sight hunting); (Figure 3.2 C); from forests such as welnut, on mountain slopes, rock, near river, fruit orchards and in field crops at different altitudes. The specimens were extracted from the net put in killing bottle killed by ethyl acetate, wrote name location, altitude and date on paper attach the specimens then prepare, pinning and sort in to genus and species levels then put in insect saving carton (Figure 3.2 D). Examinations and descriptions were done under an Olympus SZH10 stereomicroscope (Figure 3.2 A); and images (1 mm) will take by a Sony CCD and Nikon digital camera attached to an Olympus SZX7 and SZX16 stereomicroscope. Photos (1 mm) will process by Zerene Stacker 1.04 software. Then prepared and sorted in to morphospecies. Most of the morphospecies were identified to species level, but few remained undetermined. In the species list, the following data are included: valid taxa names, synonmys publishing records with provincial distribution in Turkey and other chrological data. The material was collected from different parts research area (Figure 3.3). Geographical coordinates and altitude were taken in the field by GPS. All specimens will deposit in the insect collection of the Department of Biology, University Bingöl, and Turkey (Figure 3.2 B).

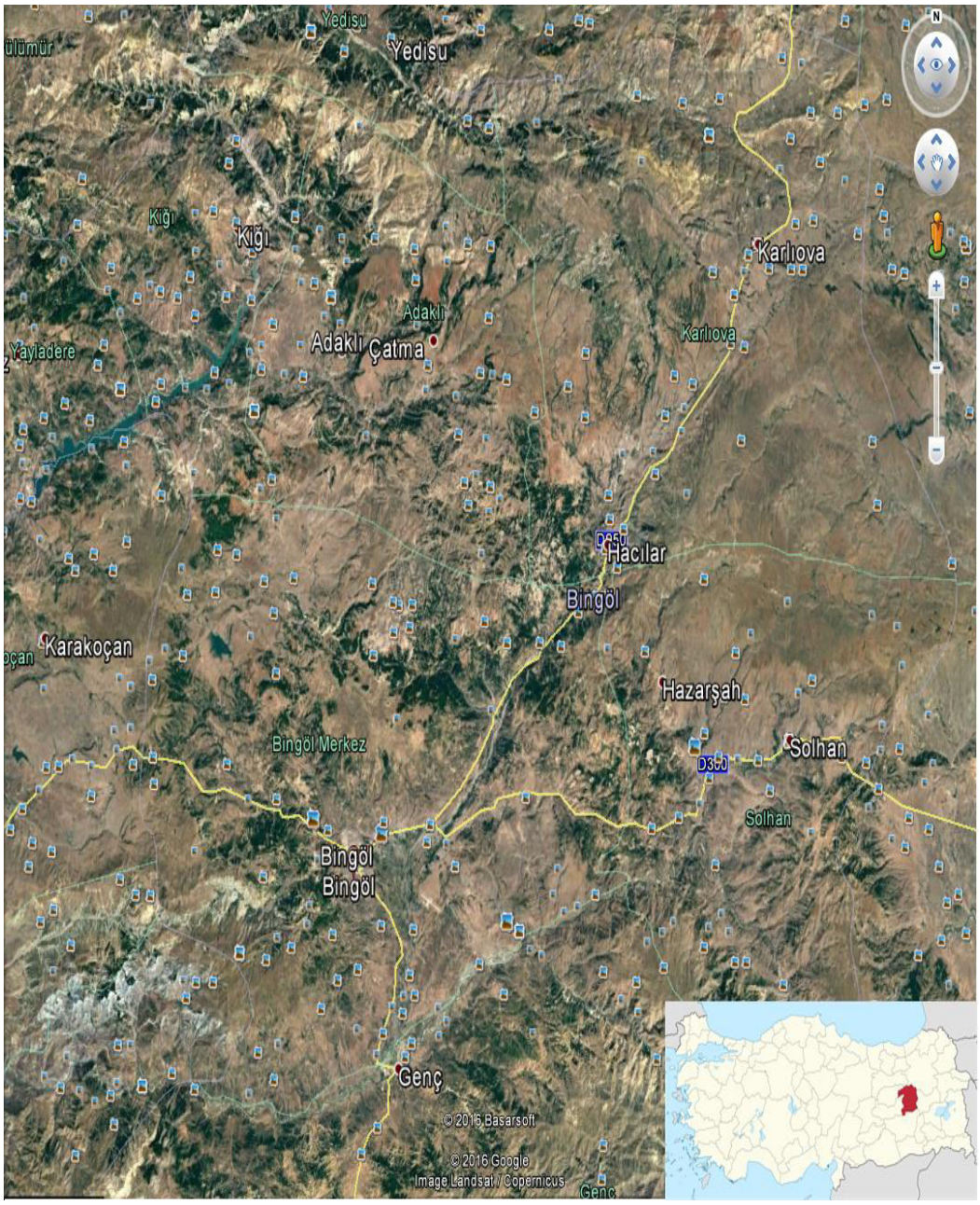


Figure 3.1. Map of research area (Bingöl)

Figure 3.2. Laboratory and study materials

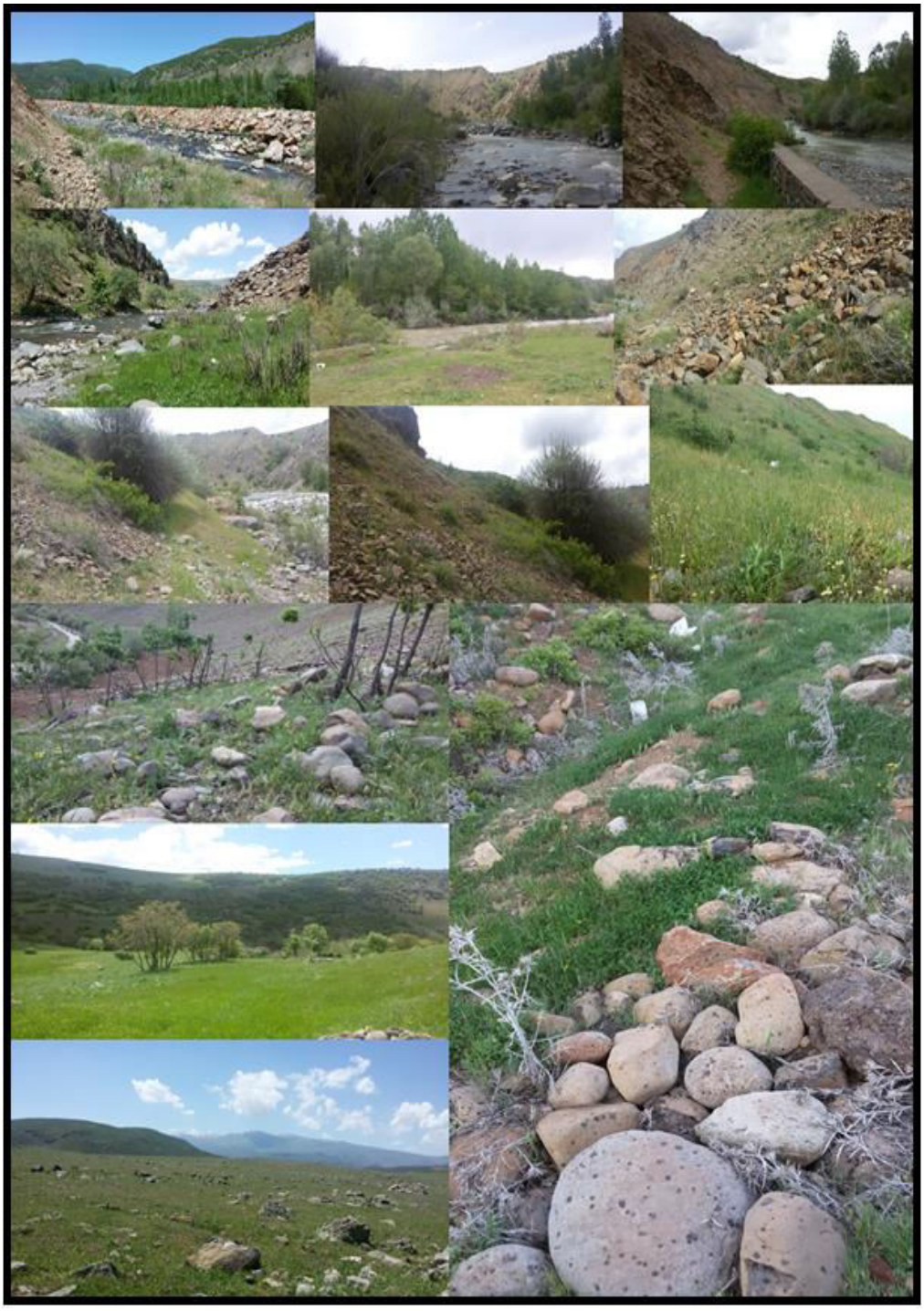


Figure 3.3. A few examples from various habitat types preferred by Chrysididae specimens throughout Bingöl province

4. RESULT

In this study; in total 350 specimens of Chrysididae including three subfamily Cleptinae, Elampinae and Chrysidinae and five genera, five specimens belonging to the Genus *Cleptes* Latreille, 1802, six specimens belonging to the genus *Holopyga* Dahlbom, 1845, 250 specimens belonging to *Chrysura* (Dahlbom, 1845), four specimens belonging to genus *Chrysidea* (Bischoff, 1910), and 85 specimens belonging to genus *Chrysis* Linnaeus, 1761 were collected. The land study was conducted between March and October 2016.

Table 4.1.Total of specimens which are collected in Bingöl Province of Turkey

Subfamily	Number of specimens
1-Chrysidinae	340
2-Cleptinae	6
3-Elampinae	4
Total	350

Table 4.2. Name of Genus and their total number which collected in Bingöl

Genus	Number of specimens
1- *Cleptes* Latreille, 1802	5
2- *Holopyga* Dahlbom, 1845	6
3- *Chrysidea* Bischoff, 1910	4
4- *Chrysis* Linnaeus, 1761	85
5- *Chrysura* Dahlbom, 1845	250
Total	350

Table 4.3. Pie chart showing subfamilies and their total specimens taken from Bingöl Province

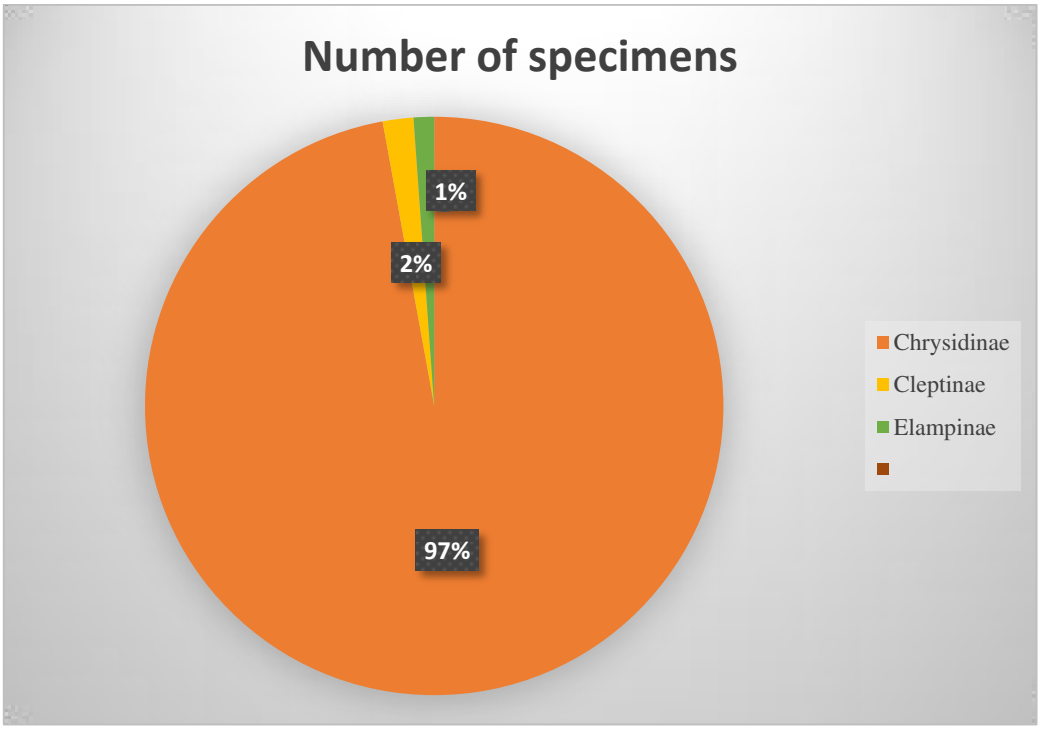
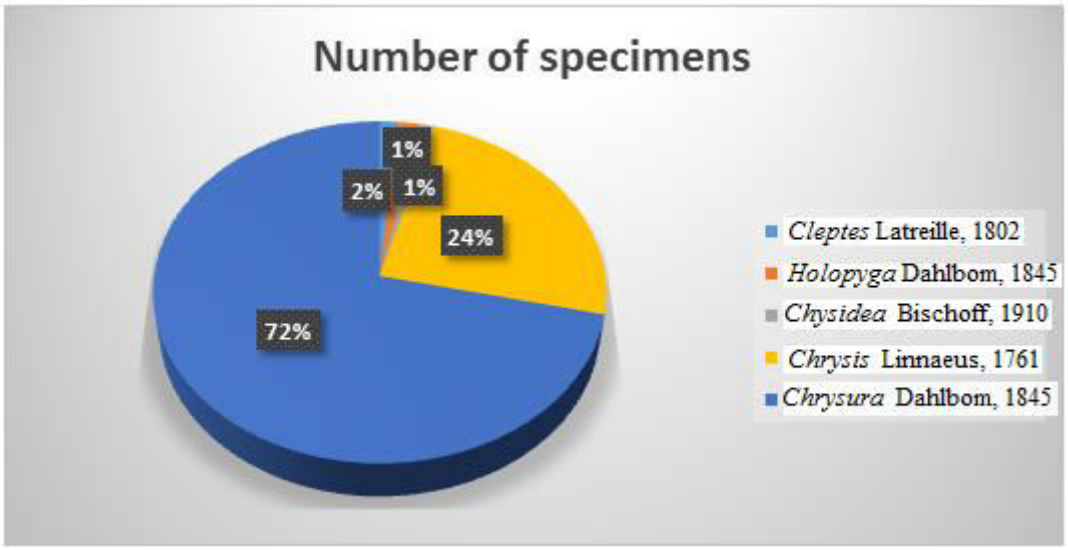


Table 4.4. Pie chart showing different Genus and their total specimens taken from Bingöl



Key to Subfamily of Chrysididae

1. Abdomen with four or more visual tergites (five in males and four in females, underside of abdomen convex ….....Cleptinae
   -Abdomen with three visual tergites, underside of abdomen convex ventral surface concave …….....2
2. Tarsal claws with one or more preapical subsidiary teeth…….……...…...Elampinae
   -Tarsal claws simple, without preapical subsidiary teeth……..……..... Chrysidinae

4.1. Subfamily: Cleptinae

The Cleptinae is considered as the simplest group in the Chrysididae; with roughly 50 explained species existed in the Palaearctic and Oriental regions and North and South America. Cleptinae can not the bowled defensive position of the Chrysidinae, although the sides of the thorax are figured to allow the legs to lie tightly opposite it. The gaster is convex underside of abdomen and has four distinguishable segments in the female and five distinguishable segments in the male. The pronotum is not wide anteriorly, with a transverse crenate sulcus producing a bulbous front neck. The lateral sides of the propodeum and metapleuron are uninterrupted. The fore wing either absent or has a not strongly defined discoidal cell, and has an abbreviated radial sector vein. The tarsal claws are dentate with a only tooth. The clypeus is medially construct; the maxillary palpi are five-segmented; the labial palpi three segmented. Cleptes species invasion saw fly larvae or pupae in their cocoons (Morgan 1984).

Cleptines are habitually medium- sized (usually 4-6 mm long) Chrysidids. By the convex face, robust mandibles with two or more teeth, and pronotum medially tightened with a suicus instantly they can be described. The abdomen has a convex venter and five obvious segments in males, four in females. The Cleptinae includes roughly 90 species and two genera, Cleptes and Cleptidea. As stated by the presently obtainable these genera are totally allopatric. Cleptes is Holarctic, with single species revolving in Argentina. Cleptidea exists in tropical region of the Neotropical area. This Sub family is the great primitive organ of Chrysididae (Kimsey and Bohart 1991).

4.1.1. Genus: *Cleptes* Latreille, 1802

This is an simply recognised genus, including some very attractively coloured wasps existed in the Palaearctic and Oriental regions and in North and South America. Pronotum with transverse front groove limited by distinguish anterior bulbous collar. Gaster with four or five distinguishable segments, ventral surface convex. The gender can be separated by the number of visible gastral tergites, four in the female and five in the male. The female antennae are not longer, with a number of segments as wide as long; males have longer antennae with all segments noticeably longer than wide (Morgan 1984).

4.1.1.1. Species: *Cleptes dahlbomi* Semenov, 1920

Material examined: 1♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 15.VIII.2016; 1♂, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.2016.

Distribution: Austria, Hungary, Israel, Jordan, Palestine and Turkey (Moczar, 1998)

Distribution in Turkey: Erzurum, Isparta and Kırklareli (Yıldırım and Strumia, 2000b; Strumia and Yıldırım, 2007; Wisnioski and Strumia, 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 4.5 mm (Figure 4.1G); the head of *Cleptes dahlbomi* Semenov, 1920 as wide as long; their mid ocellus little smaller than antennal socket, eyes small, malar space about 1.5 MOD, mandible robust, propodeal tooth triangular shorter than broad and tarsal claws with one perpendicular sub medial tooth and forewing discoidal cell specified by stained vein remains. Colaration: face and mandible are green (Figure 4.1C); antennae brown (Figure 4.1A); vertex and gena blue to violet pronotum blue (Figure 4.1B); mesoscutum, are green (Figure 4.1F); mesoscutellum, metanotum, propodeum, coxa, femur, tibia are blue (Figure 4.1D); abdomen entirely green with golden reflection (Figure 4.1F); and metasomal sternites metallic (Figure 4.1 E).

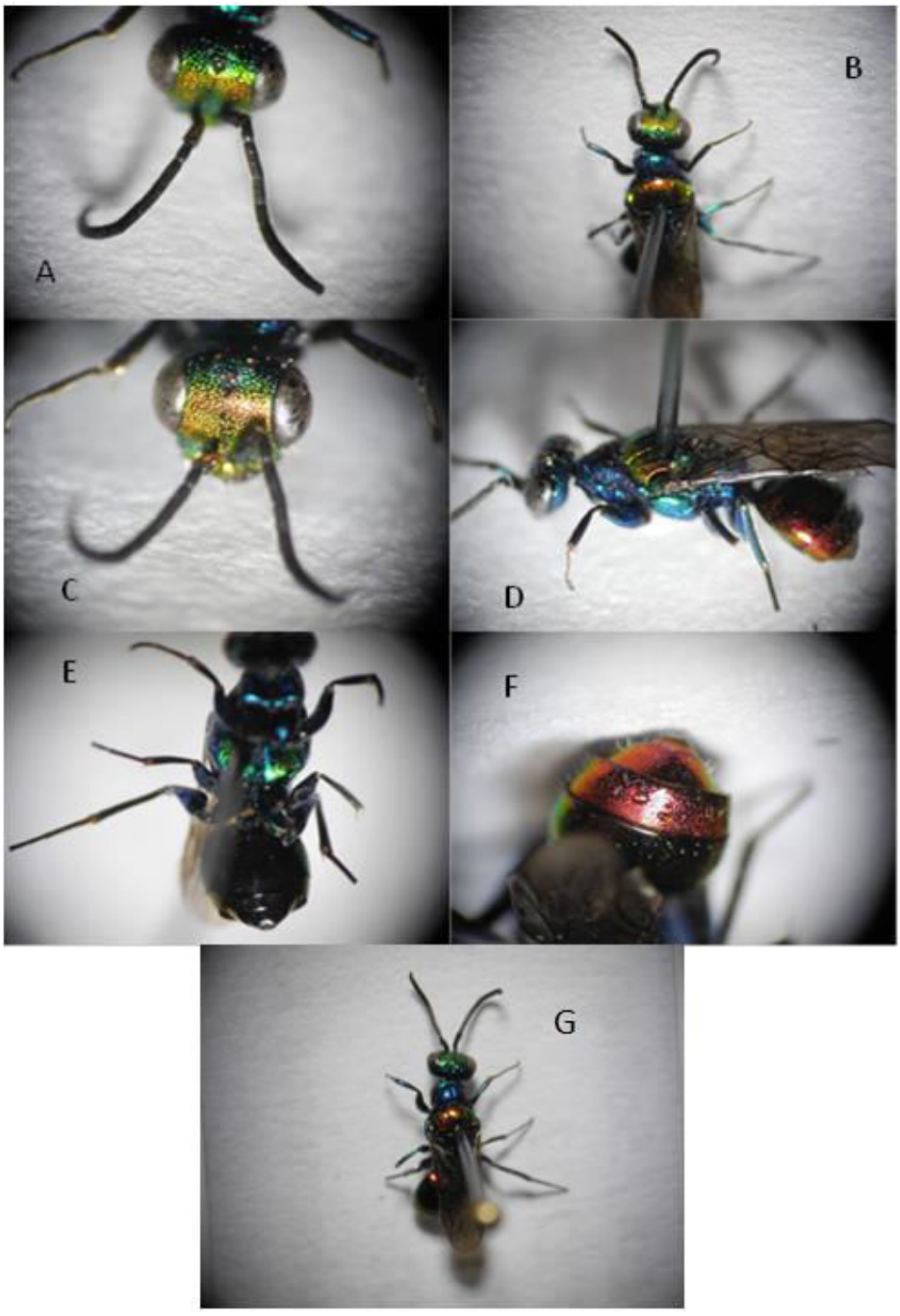


Figure 4.1. *Cleptes dahlbomi* Semenov, 1920 (Male): A) Head, antennae, dorsal view B) Head, pronotum, dorsal view C) Head, frontal view D) Body, lateral view E) Body, ventral view F) Metasoma, dorsal view G) Dorsal overview

4.2. Subfamily Elampinae

The Elampinae is the huge group in terms of genera and species. By the existence of a subapical row of pits, or subdued indication of such, across T-III these can be recognizable. Next in size and complexity is the Elampinae group. There are three visible terga and, for the most portion, dentate tarsal claws (Kimsey and Bohart1991).

4.2.1. Genus: *Holopyga* Dahlbom, 1845

The species of genus *Holopyga* (Dahlbom, 1845) are big rather around species but no small, with numbers of teeth on claws. The distal cell of wings and basal vein both are curved at a right angle. Nemberless species of *Holopyga* (Dahlbom, 1845) be found in all geographical region, usally they are very slightly different in appearance (Linsenmaier 1994c).

4.2.1.1. Species: *Holopyga ignicollis* Dahlbom, 1854

Material examined: 1♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 15.VIII.2016.

Distribution: Algeria, Egypt, Greece, Iran, Morocco and Turkey (Kimsey and Bohart 1991; Linsenmaier 1999; Wisniowski & Strumia 2007; Farzaneh et al. 2017).

Distribution in Turkey: Ankara, Aksaray, Artvin, Balikesir, Bayburt, Bilecik, Denizli, Erzincan, Erzurum, Eskişehir, Kastamonu, Karaman, Kars, Konya, Nevşehir and Tokat (Yıldırım and Strumia 2006a; Yıldırım and Strumia 2011).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 5.5 mm (Figure 4.2 G); scapal basin deep and transversely cross-riged, facial setae and erect (Figure 4.2 A); vertex with inter-ocellar sulcus; malar space about 1 MOD (Figure. 4.2 B); gena carina existent; pronotum with anteromedial pit; mesopleuron strongly angulate, with well- evolved verticaulus, omaulus, signum, and scrobal carina (Figure. 4.2 D,F); hind tarsal claws multi-subsidiary teeth, fore wing

medial vein strongly arched, stigma short and broad, R1 clearly specified (Figure 4.2 G); T-III apical margin evenly sphered or somewhat specified medially slightly swollen subapically (Figure 4.2 C); male genitalia volsella with digitus and cupis. Colaration: face and mandible are blue with green reflection (Figure 4.2 B); antennae brown (Figure 4.2 A); vertex and gena blue to violet pronotum, mesoscutum, mesoscutellum, metanotum, propodeum, are blue with green reflection, coxa, femur, tibia are metallic (Figure 4.2 G); abdomen entirely green with golden reflection (Figure 4.2 C, D); and metasomal sternites not metallic, (Figure 4.2 E).

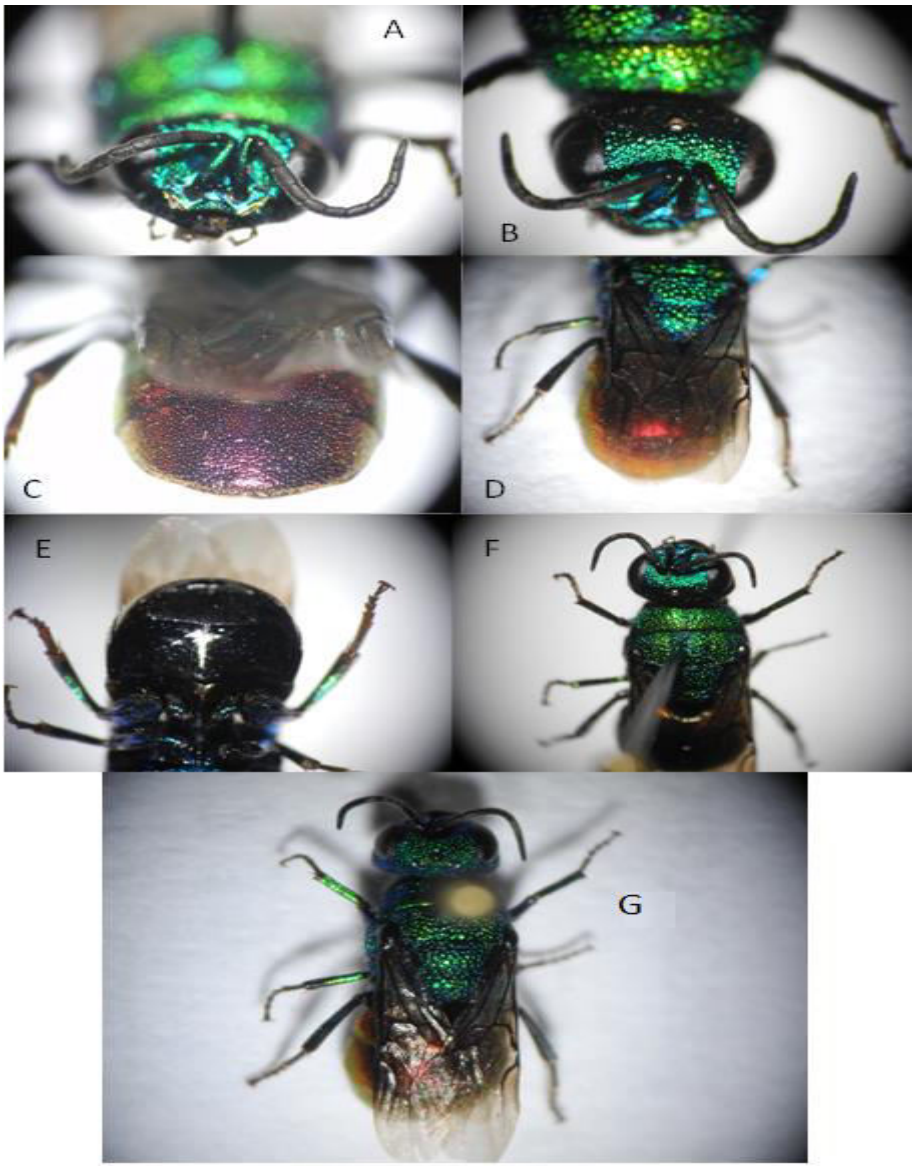


Figure 4.2. Male *Holopyga ignicollis* Dahlbom, 1854 (Male): A) Head, antennae, frontal view B) Head, pronotum, dorsal view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Head, legs, thorax dorsal view G) Dorsal overview

4.3. Subfamily Chrysidinae

Chrysidinae is the largest Sub family of Chrysidids in number of species, comprising 80 percent of the family. By their bright metallic, coloration (except in a few rare exceptions), and three or less commonly four, visible gastra terga, and concave or flat abdominal venter these wasps can be recognized. In all Zoogeagraphic regions members of this Subfamily are generally encountered. Commonly nest parasites of wasps and bees, though praestochrysis attacks prepual moth larvae. Divided in to four tribes: Elampini, Allocoeliini, Parnopini and the Chrysidini (Kimsey and Bohart 1991).

Key to Genera of Chrysidinae

1 -Face uncommonly flat, T-III apical rim without teeth…..…..……..…....*Chrysura*
-Face often with concaved scapal basin, T-III apical rim commonly with teeth or medially notched…...……...…..2
2 -Gena with 2 carinae elongated from mandible base forming a subgenal triangle; T-III rim widely rimed between apicolateral angles frons usually with 2 transverse carinae divided by a reflective area…….……. *Chrysidea*
-Gena with 1 carina or seldom none; T-III rim different; frons commonly with one single TFC or with out TFC……..……...….....….*Chrysis*

4.3.1. Genus: ***Chrysura*** (Dahlbom, 1845)

Face fairly flat without medial area of cross ridging but occasionally with medial microreticulation; without TFC; malar space commonly 2 MOD or more; mandible with subapical tooth; mid ocellus not circled; basal flagellomeres F-II-V of male often swollen ventrally; pronotum short and commonly shorter than scutellum, lateral depression shallow and seldomly indicated; mesopleuron with scrobal sulcus and episternal sulcus; propodeal angle subtriangular; fore wing discoidal cell complete; T-II longitudinal ridge sometimes difened but not sharp; T-III pit row not deeply concaved and often not stronge, apical rim evenly circled, truncate orindented medially. Male terminalia: S-VIII subtriangular; gonocoxa broad or not widely tapering apically, inner margin often

angulate subapically; cuspis long, digitus slender and shorter than cuspis; aedeagus slender and acute apically.

Key to Species of *Chrysura*

1-Posterior of T3 without teeth and medially notched…….2

-Posterior of T3 without teeth and medially pointed or arounded…….6

2-Malar space about 2 MOD…….……..……..3

-Malar space about 2.5 MOD……...…..…….……4

3-Abdomen green with golden reflection……..……..*Chrysura anatolicata*

-Abdomen green not with golden reflection ……...……....*Chrysura simplex*

4-S-II spots large …….……...…… 5

-S-II spots not large……..…....*Chrysura trimaculata*

5-S-II spots elongated and entirely green……..…….....*Chrysura ignifrons*

-S-II spots not entirely green……...….*Chrysura dichoroa*

6-Malar space about 2 MOD……..……...*Chrysura ciscirtana*

-Malar space about 2.5 MOD.……..……7

7-F-II-V of male symmetrical……..…….....*Chrysura pseudodichroa*

-F-II-V of male asymmetrical…….……...8

8-Abdomen monocolor red coppery…….……..*Chrysura baccha*

-Abdomen various color, T1 green, T2 and T3 red color……..….….*Chrysura laevigata*

4.3.1.1. Species: *Chrysura anatolicata* Trautman, 1926

Material examined: 4♂♂, 2♀♀, Bingöl center, 38°54'24"N 40°30'20"E, 1145 m, 14.VIII.2016; 2♂♂, 38°54'24" N 40°30'20" E, 1113 m, 12.VIII.201; 4♂♂, Genç, 38°44'57" N 40°31'35" E, 997 m,15.V.2016; 2♂♂, Solhan, 38°57'17" N 40°58'13"E, 1280m, 17.V.2016.

Distribution: Germany and Turkey (Kimsey and Bohart 1991).

Distribution in Turkey: Erzurum and Şanlıurfa (Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 8.5 mm (Figure 4.3 G); F-I 2 time as long as F-II or F-III; falgellomers F-II-V of male not bulging, F-I l/w 4 (Figure 4.3 A, B); face flat with no medial zone, no TFC, malar space about 2 MOD (Figure 4.3 A); mid ocellus not lidded (Figure 4.3 B); pronotum shorter than scutellum (Figure 4.3 G); pit row weak not deep, but as deep as *Chrysura ignifrons* (Figure 4.3 D); apex of T-III without teeth (Figure 4.3 C); fore wing discoidal cell complete (Figure 4.3 C); propodeal angle subtriangular (Figure 4.3 G). Colaration: Antennae brown, but pedicel, scape and F-I, F-II are metallic green (Figure 4.3A, B); face metallic green (Figure 4.3 A); vertex head green-golden, gena area blue (Figure 4.3 G); tegula blue with green reflection pronotum, mesoscutum, mesoscutellum, metanotum, propodeum, are blue (Figure 4.3 G); T-I, T-II, T-III are green with golden reflection (Figure 4.3 C); but coxa, femur, tibia are metallic green, (Figure 4.3 F and G); metasomal sternites metallic green (Figure 4.3 E).

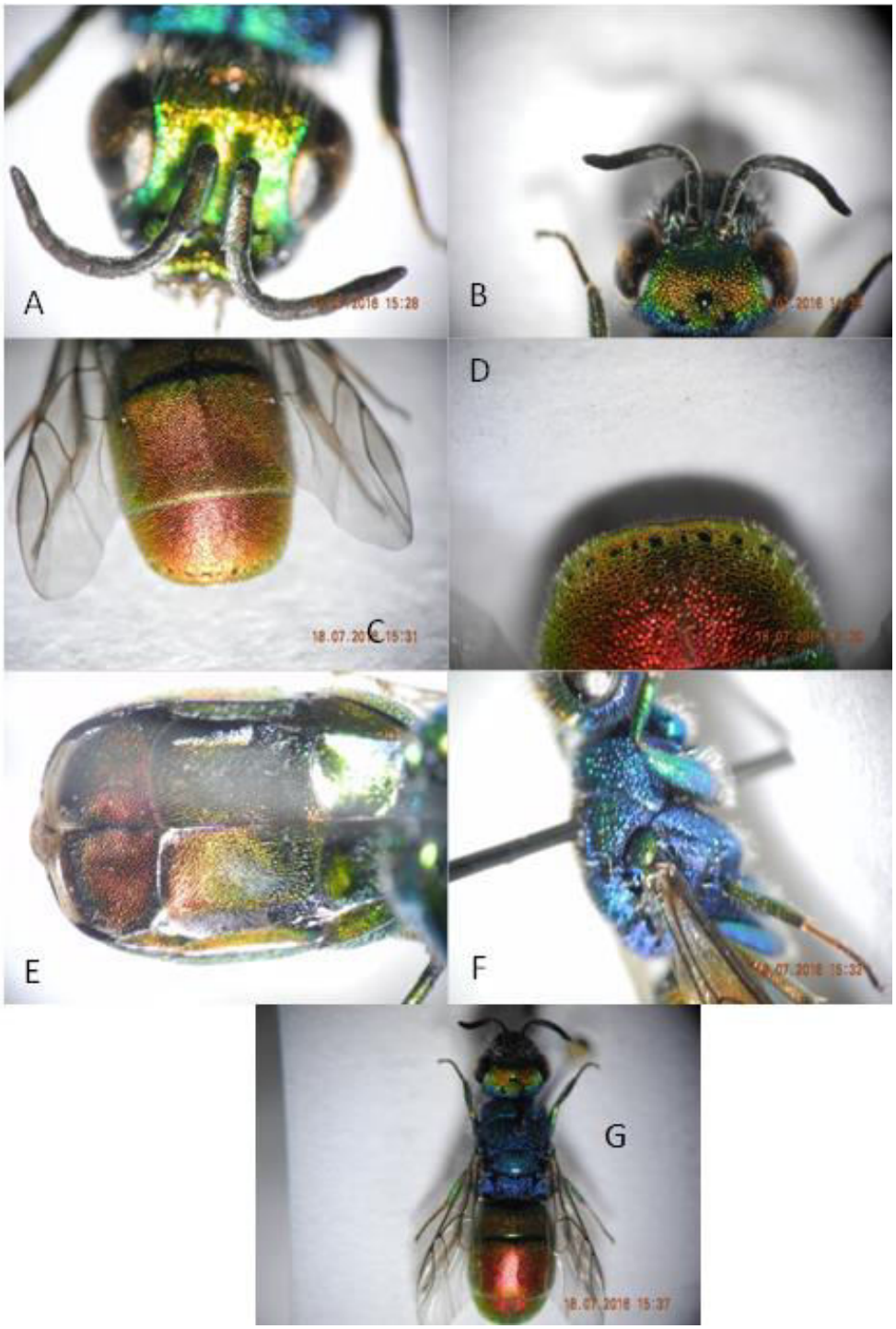


Figure 4.3. *Chrysura anatolicata* Trautman, 1926 (Male): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Apex T-III dorsal view E) Metasomal sternites, ventral view F) Thorax lateral view G) Dorsal overview

4.3.1.2. Species: *Chrysura simplex* (Dahlbom, 1854)

Material examined: 3♂♂, 2♀♀, Bingöl center, 38°54'50" N 40°31'16" E, 1170 m, 05.IV. 2016; 1♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 21-25.VIII.2016.

Distribution: Greece and Turkey (Kimsey and Bohart 1991).

Distribution inTurkey: Erzurum (Yıldırım and Strumia 2006b).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 7 mm (Figure 4.4 G); F-I 2, 5 time as long as F-II or F-III; falgellomers F-II-V of male bulging and asymmetrical, F-I l/w near 3.5 (Figue 4.4 B); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded (Figure 4.4 A); pronotum shorter than scutellum, metanotum a little bulging (Figure 4.4 D and G); pit row weak not deep (Figure 4.4 C, F); S-II spots indistinct, apex of T-III without teeth (Figure 4.4 E); fore wing discoidal cell complete (Figure 4.4 C); propodeal angle subtriangular (Figure 4.4 D). Coloration: Antennae dark brown, but pedicel, scape and F-I are metallic green (Figure 4.4 A); face, vertex, head, gena area, pronotum, mesoscutum, mesoscutellum, tegula, metanotum, propodeum, T-I, T-II, T-III are mono color (green); coxa, femur, tibia are metallic green (Figure 4.4 A, B, C, D and F); metasomal sternites metallic green (Figure 4.4 E).

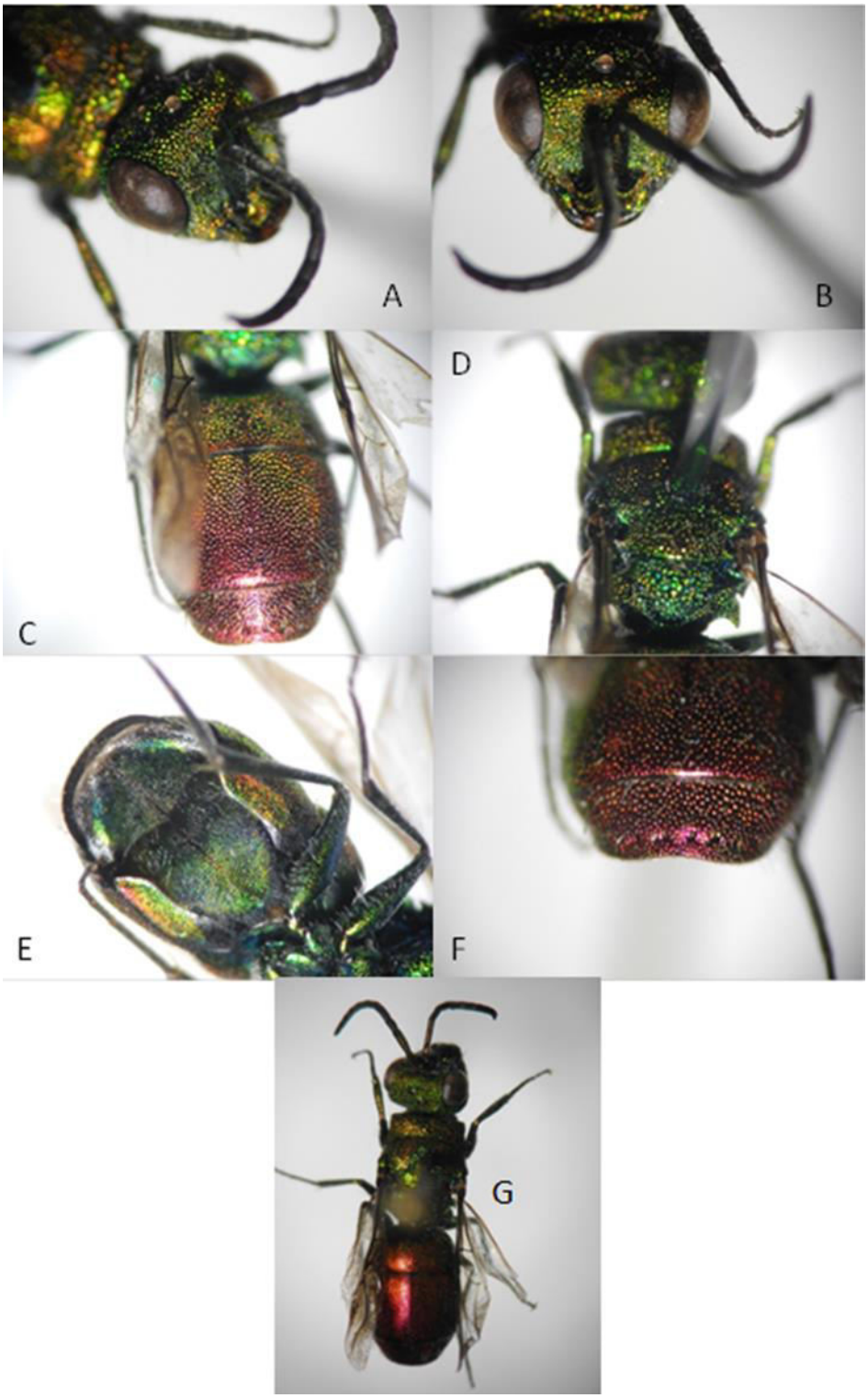


Figure 4.4. *Chrysura simplex* (Dahlbom 1854) (Male): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.3. Species: *Chrysura trimaculata* (Fröster, 1853)

Material examined: 2♂♂, Bingöl center, 38°54'50" N 40°31'16" E, 1170 m, 04.V. 2016.

Distribution: Turkey (Kimsey and Bohart 1991).

Distribution in Turkey: Not detailed locality (Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 11 mm (Figure 4.5 G); F-I 2.5 time as long as F-II or F-III; falgellomers F-II-Vof male not bulging and symmetrical, F-I l/w about 3.5 (Figure 4.5 B); face flat with no medial zone, no TFC, malar space 2.5 MOD, mid ocellus not lidded (Figure 4.5 A); pronotum shorter than scutellum (Figure 4.5 G); pit row weak not deep (Figure 4.5 F); S-II spots not large, semicircle and well separated (Figure 4.5 E); apex of T-III without teeth (Figure 4.5 C, F); fore wing discoidal cell complete (Figure 4.5 G); propodeal angle subtriangular (Figure 4.5 D).Colaration: Antennae dark brown, but pedicel, scape and F-I are metallic green (Figure 4.5 A); face, vertex, head, gena area, pronotum, mesoscutum, mesoscutellum, tegula, metanotum, propodeum, are blue with green reflection (Figure 4.5 D and G); T-I green, but T-II, T-III (abdomen) are cuppery, (Figure 4.5 C); coxa, femur, tibia are metallic green (Figure 4.5 G); metasomal sternites metallic green (Figure 4.5 E).

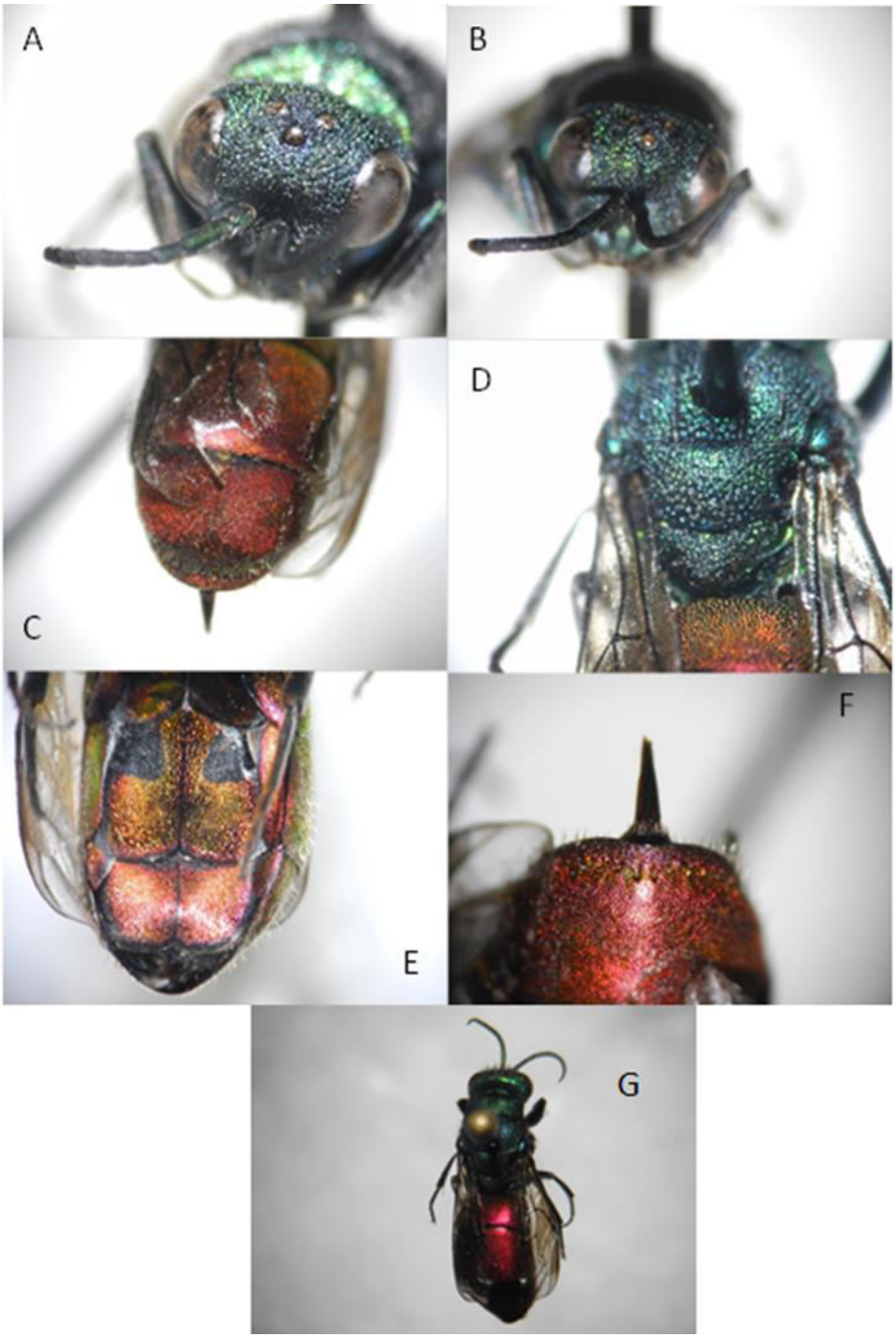


Figure 4.5. *Chrysura trimaculata* (Fröster, 1853) (Male): A) Head, dorsal view B) Head, frontal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.4. Species: *Chrysura ignifrons* (Brulle, 1832)

Material examined: 2♂♂, Bingöl center, 38°54'50" N 40°31'16" E, 1042 m, 01.IV.2016; 5♀♀, 2♂♂, 38°54'50" N 40°31'16" E, 1170 m, 10-23.VIII. 2016; 5 ♀♀, 4♂♂, 38°54'24" N 40°30'20" E, 1113 m, 14.VIII.2016; 5♀♀, 5♂♂, 38°54'24" N 40°30'20" E, 1145 m, 07.IV.2016; 8♀♀, 6♂♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 21-25.VIII.2016; 2♂♂, 3♀♀, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.201; 3♀♀, 1♂, Yüzen Ada, 38°97'00"0 N 40°94'38"83 E, 1320 m, 09.V.2016; 4♀♀ Yedisu, 39°13'24" N 40°40'04" E, 1500 m, 20.V.2016; 3♀♀, 2♂♂, Adaklı, 39°13'15" N 40°28'49" E, 1491 m, 22.V.2016; 6♀♀, 3♂♂, Kigı, 39°19'01" N 40°40'21" E, 1702 m, 19.V.2016; 4♀♀, 3♂♂, Ilıcalar, 38°59'18" N 40°40'30" E, 1171 m, 19.VII.2016.

Distribution: Austria, Greece, Italy, Palestine, Spain, Switzerland, Syria, USSR and Turkey (Kimsey and Bohart 1991; Linsenmaier 1959).

Distribution in Turkey: Erzurum, Karaman, Konya, Mardin, Sivas and Şanlıurfa (Strumia and Yıldırım 2007; Yıldırım and Strumia 2006b; Wisniowski and Strumia 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 8 mm (Figure 4.6 G); F-I 2.5 time as long as F-II or F-III; falgellomers F-II-V of male not bulging, F-I l/w 4 (Figure 4.6 B); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded, (Figure 4.6 A); pronotum shorter than scutellum (Figure 4.6); pit row not deep, apex of T-III without teeth, (Figure 4.6 C,F); fore wing discoidal cell complete, (Figure 4.6 G); propodeal angle subtriangular(Figure 4.6 G). Colaration: Antennae dark brown, but pedicel, scape and F-I, F-II are metallic green (Figure 4.6 B); face metallic green, vertex head blu, gena area, pronotum, mesoscutum, mesoscutellum, tegul, metanotum, propodeum, are blue with green reflection, (Figure 4.6 G); T-I, T-II are metallic green, but T-III red, (Figure 4.6 C); coxa, femur, tibia are metallic green (Figure 4.6 G); metasomal sternites metallic green (Figure 4.6 E).

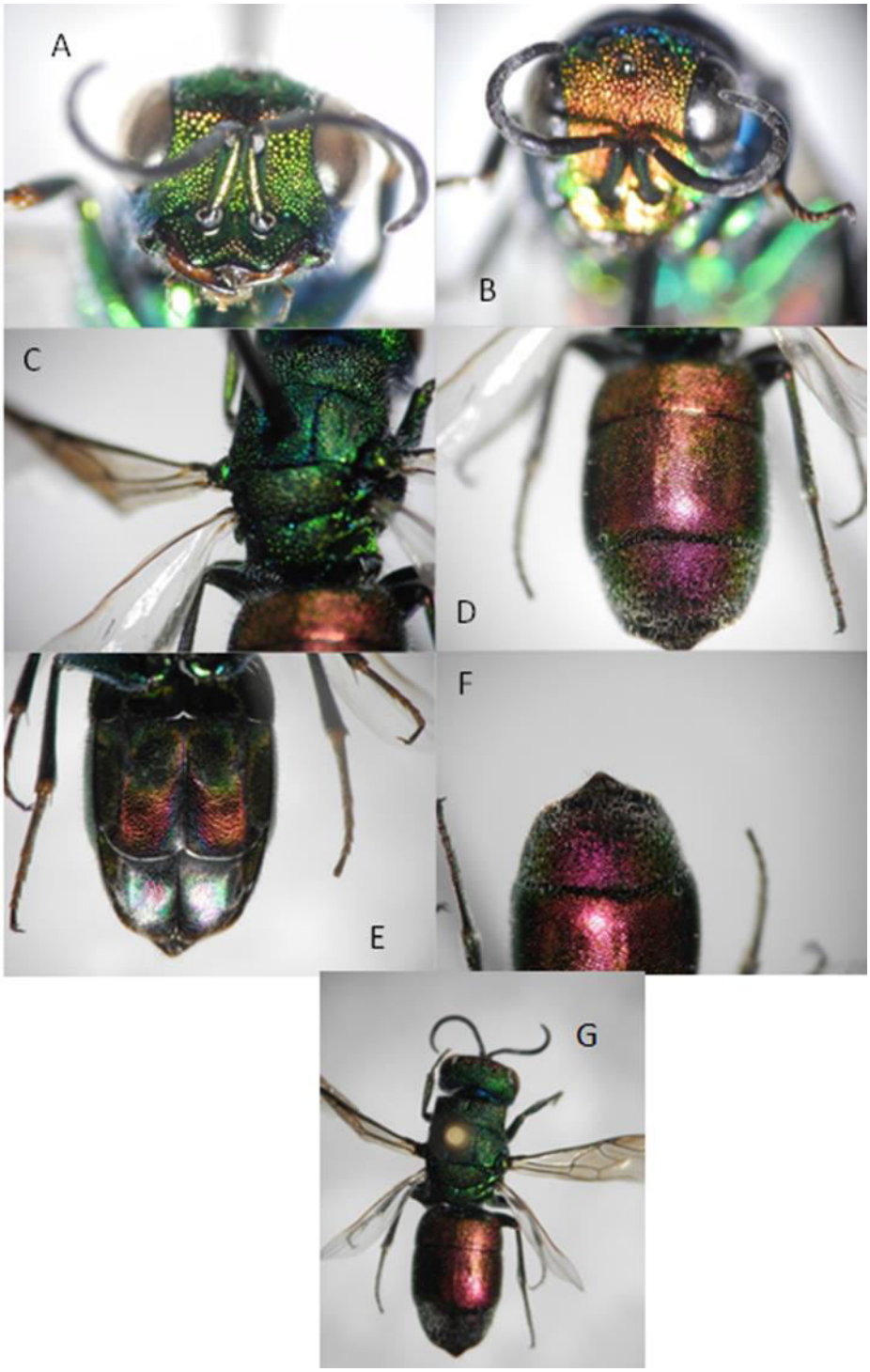


Figure 4.6. *Chrysura ignifrons* (Brulle, 1832) (Female): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.5. Species: ***Chrysura dichroa*** (Dahlbom, 1845)

Material examined: 2♂♂, 2♀♀ Genç, 38°44'57" N 40°31'35" E, 997 m, 17.VIII.2016.

Distribution: Austria, Italy, Palestina USSR and Turkey (Kimsey Bohart 1991).

Distribution in Turkey: Adana, Antalya, Bingöl, Bilecik, Çanakkale, Erzincan, Erzurum, Isparta, Kırklareli, Konya, Mersin, Konya, Sivas, Şanlıurfa and Turkey (Strumia and Yıldırım 2007; Yıldırım and Strumia 2006b; Wisniowski and Strumia 2007).

Diagnosis: Body length about 6.5 mm, (Figure 4.7 G); F-I 2.5 time as long as F-II or F-III; falgellomers F-II-V of male bulging and asymmetrical, F-I l/w 4, (Figure 4.7 B); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded (Figure 4.7 A); pronotum shorter than scutellum, metanotum a little bulging, (Figure 4.7 G); pit row weak not deep (Figure 4.7 C, F); S-II spots large, oval and separated (Figure 4.7 E); apex of T-III without teeth (Figure 4.7 C); fore wing discoidal cell complete, propodeal angle subtriangular (Figure 4.7). Colaration: Antennae dark brown, but pedicel, scape and F-I, F-II are metallic green (Figure 4.7 B); face, vertex, head, gena area are blue to green (Figure 4.7);pronotum, mesoscutum, mesoscutellum, tegul green, metanotum, propodeum, are blue with purple reflection (Figure 4.7 D); T-I green, but T-II, T-III cuppery-red, (Figure 4.7 A, C); coxa, femur, tibia are metallic green, but some species metallic blue (Figure 4.7 G); metasomal sternites metallic green (Figure 4.7 E).

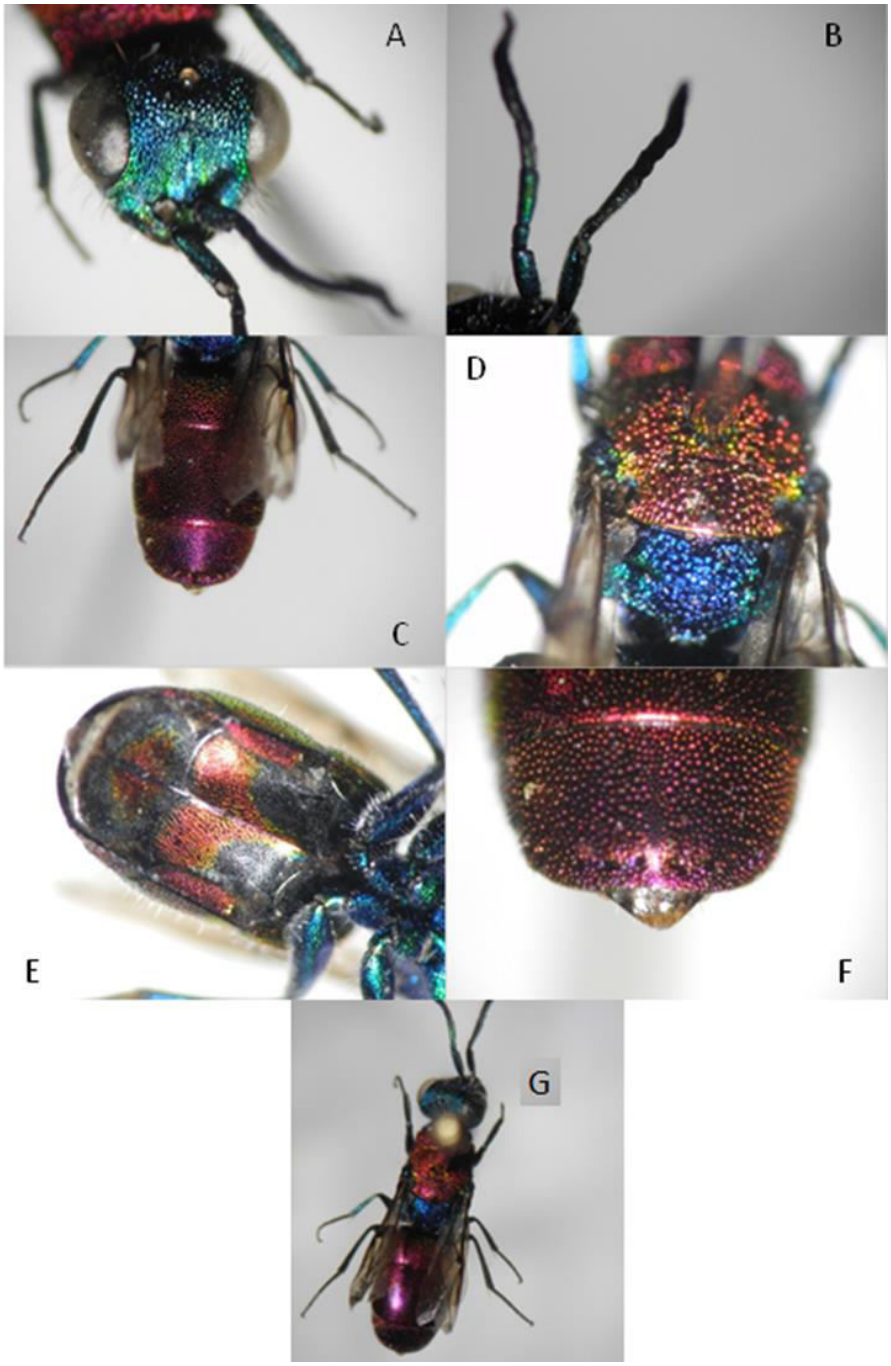


Figure 4.7. *Chrysura dichroa* (Dahlbom, 1845) (Male): A) Head, frontal view B) Antennae, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.6. Species: ***Chrysura ciscirtana*** Linsenmaier, 1959

Material examined: 11♀♀, 4♂♂, Bingöl center, 38°54'50" N 40°31'16" E, 1042 m, 01.IV. 2016; 8♀♀ 7♂♂, 38°54'50" N 40°31'16" E, 1170 m, 05.IV.2016; 7♀♀ 4♂♂, 38°54'24" N 40°30'20" E, 1113 m, 14.V.2016; 6♀♀ 5♂♂, 38°54'24" N 40°30'20" E, 1145 m, 25.VIII. 2016;10♀♀, 3♂♂, Genç, 38°44'57"N 40°31'35"E, 997 m, 15-28.V.2016; 7♂♂, 11♀♀, Solhan, 38°57'17"N 40°58'13"E, 1280 m, 17.V.2016; 2♀♀, 1♂, Yüzen Ada, 38°97'00"0 N 40°94'38"83 E, 1320 m, 09.V.2016; 11♀♀, 3♂♂, Yedisu, 39°13'24" N 40°40'04" E, 1501 m, 20.V.2016; 6♀♀, 4♂♂, Adaklı, 39°13'15" N 40°28'49" E, 1491 m, 22.V.2016; 7♀♀, 3♂♂, Kigı, 39°19'01" N 40°40'21" E, 1702 m, 19-29.V.2016; 8♀♀,6♂♂, Ilıcalar, 38°59'18" N 40°40'30" E, 1171 m, 16.V.2016; 6♂♂ 6♀♀, Karlıova, 39°17'55" N 40°00'51" E, 1940 m, 22-28.V.2016.

Distribution: Palestine and Turkey (Kimsey and Bohart 1991).

Distribution in Turkey: Ankara, Bilecik, Diyarbakir, Erzincan, Erzurum, Tokat and Şanlıurfa (Strumia and Yıldırım 2007; Wisniowski and Strumia 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 5 mm (Figure 4.8 G); F-I 2 time as long as F-II or 3 time as long as F-III; falgellomers F-II-V of male bulging, F-I l/w near 4 (Figure 4.8 A, B); face flat with no medial zone, no TFC, malar space about 2 MOD (Figure 4.8 A); mid ocellus not lidded (Figure 4.8 B); pronotum shorter than scutellum (Figure 4.8); pit row distinct not deep, a pex of T-III without teeth (Figure 4.8 F); fore wing discoidal cell complete (Figure 4.8 C); propodeal angle subtriangular (Figure 4.8 G). Colaration: Antennae dark brown, but pedicel, scape and F-I are metallic green (Figure 4.8 B); face metallic green vertex head blue with green reflection (Figure 4.8 A); gena area blue, pronotum, mesoscutum are green, mesoscutellum, tegul, metanotum, propodeum, are blue (Figure 4.8 G); T-I, T-II, T-III are green-golden (Figure 4.8 C); coxa, femur, tibia are metallic green (Figure 4.8 G); metasomal sternites metallic green (Figure 4.8 E).

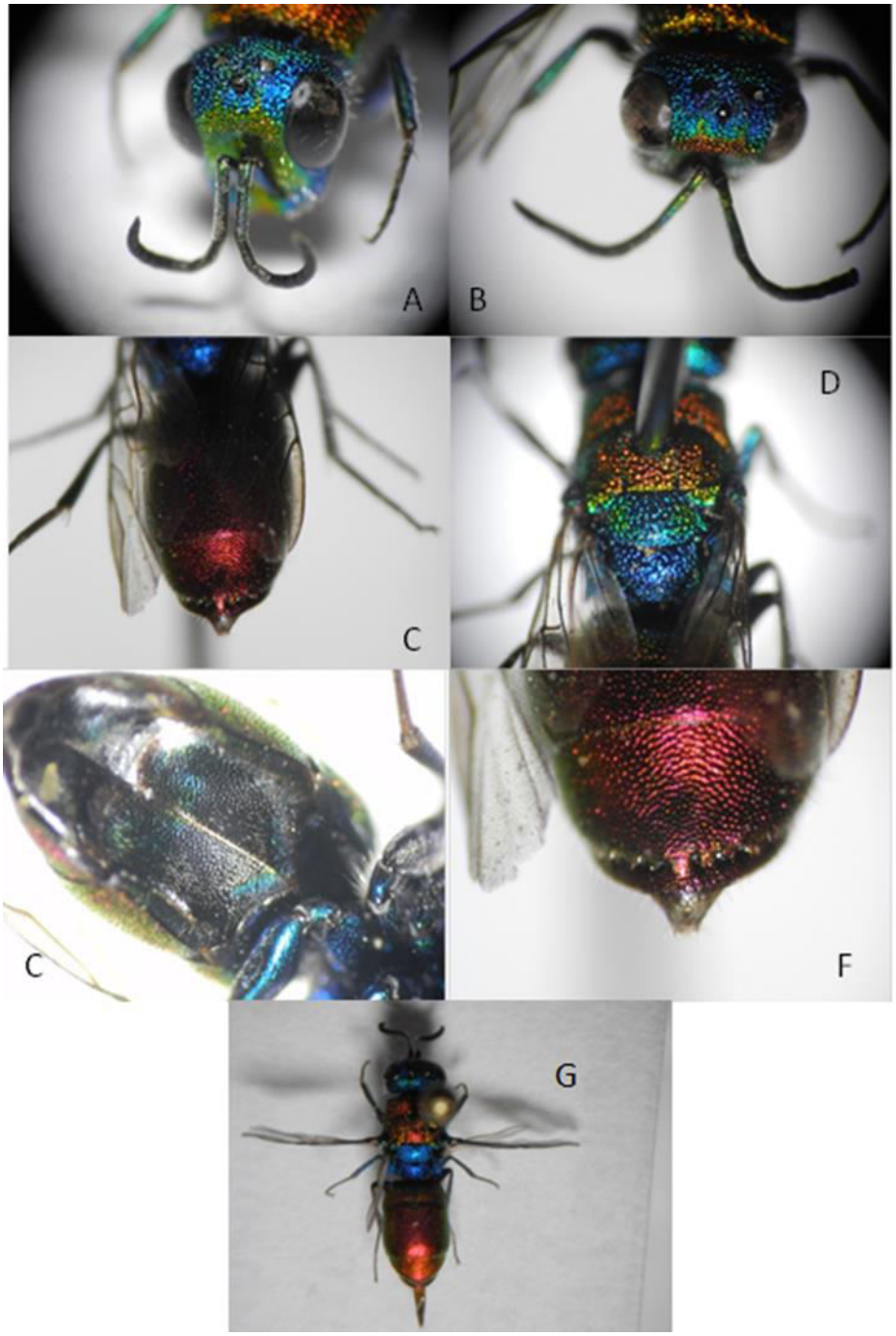


Figure 4.8. *Chrysura ciscirtana* Linsenmaier, 1959 (Female): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.7. Species: *Chrysura pseudodichroa* (Linsenmaier, 1959)

Material examined: 1♀, Bingöl center, 38°54'50" N 40°31'16" E, 1042 m, 01.IV.2016; 1♀, 38°54'50" N 40°31'16" E, 1170 m, 05.IV.2016; 2♀♀, 38°54'24" N 40°30'20" E, 1113 m, 14.V. 2016; 2♂♂, 38°54'24"N 40°30'20" E, 1145 m, 25.VIII.2016; 2♂♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 15,28.V.2016; 2♂♂, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.2016; 1♂, Yüzen Ada, 38°97'00"0 N 40°94'38"83 E, 1320 m, 09.V.2016; 1♀, Ilıcalar, 38°59'18" N, 40°40'30" E, 1171m, 16.V.2016.

Distribution: Cyprus, France, Greece, Iran, Italy, Libya, Palestine, Spain, USSR, Turkey and Yugoslavia (Linsenmaier 1959, 1997; Kimsey and Bohart 1991; Rosa et al. 2013).

Distribution in Turkey: Erzurum (Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 6.5 mm (Figure 4.9 G); F-I 3 time as long as F-II or F-III; falgellomers F-II-V of male not bulging and symmetrical, F-I l/w 4, (Figure 4.9 A); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded (Figure 4.9 B); pronotum shorter than scutellum, metanotum a little bulging (Figure 4.9 D); pit row weak not deep (Figure 4.9 F); S-II spots large, oval and separated (Figure 4.9 E); apex of T-III without teeth (Figure 4.9 C, F); fore wing discoidal cell complete (Figure 4.9 G); propodeal angle subtriangular (Figure 4.9 D). Colaration: Antennae dark brown, but pedicel, scape and F-I, F-II are metallic green (Figure 4.9 B); face, vertex, head, gena area are blue to green (Figure 4.9 A); pronotum, mesoscutum, mesoscutellum, tegul green, metanotum, propodeum, are blue with purple reflection (Figure 4.9 D); T-I, T-II, T-III cuppery-red (Figure 4.9 C); coxa, femur, tibia are metallic green, but some species metallic blue, (Figure 4.9 G); metasomal sternites metallic green (Figure 4.9 F).

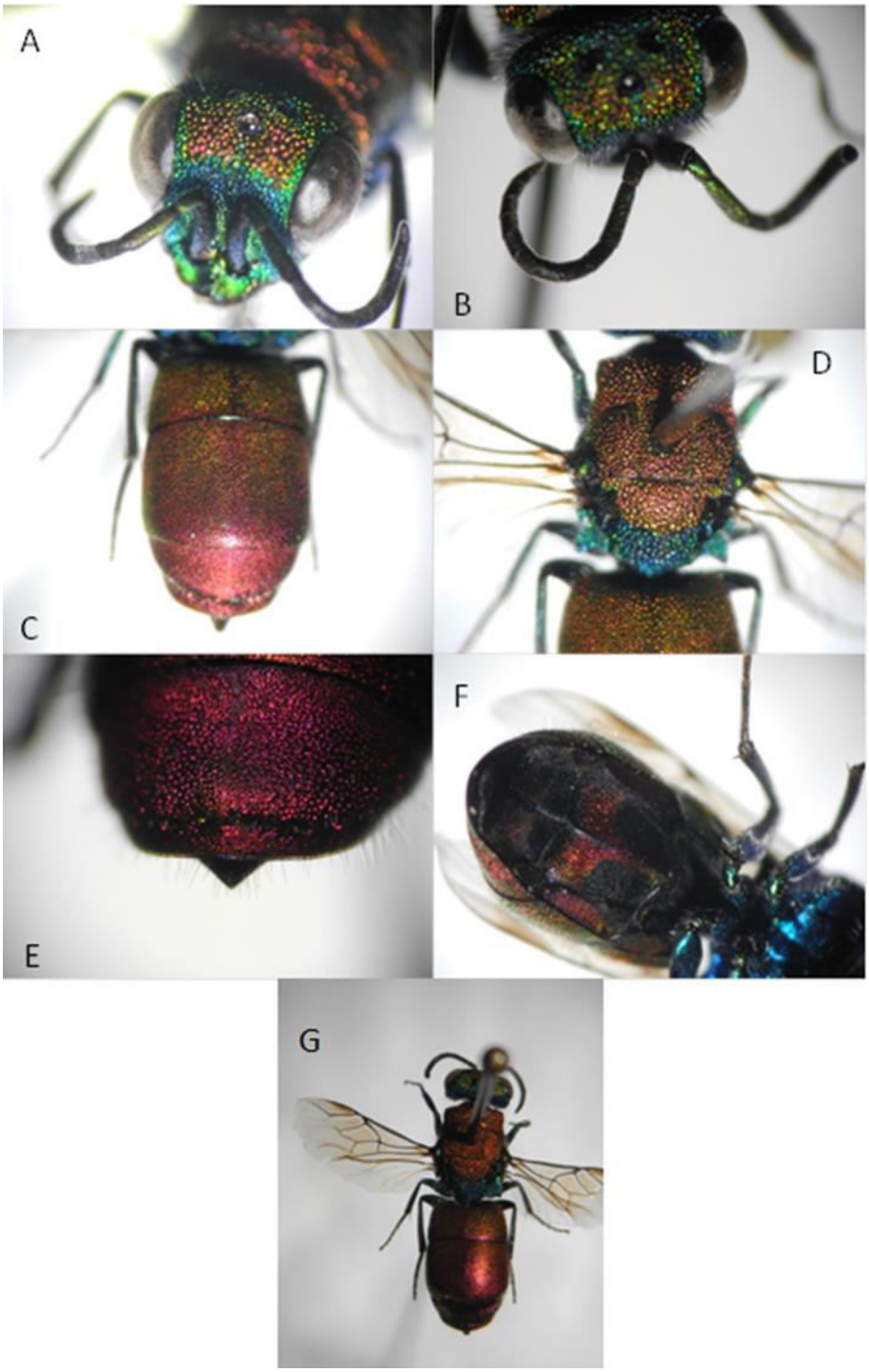


Figure 4.9. *Chrysura pseudodichroa* (Linsenmaier, 1959) (Male): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Apex T-III dorsal view F) Metasomal sternites, ventral view G) Dorsal overview

4.3.1.8. Species: *Chrysura baccha* (Balthasar, 1953)

Material examined: 2♂♂, Bingöl Center, 38°54'50" N 40°31'16" E, 1042 m, 01.IV.2016; 2♂♂, Kigı, 39°19'01" N 40°40'21" E, 1702 m, 19.V.2016; 2♂♂, Karlıova, 39°17'55" N 40°00'51" E, 1940 m, 28.V.2016.

Distribution: Greece, Iran, Lebanon, Palestine and Turkey (Linsenmaier 1968; Rosa et al. 2013).

Distribution in Turkey: Erzurum (Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province. It was recorded by Strumia and Yıldırım (2007), but the genus name is incorrect. They classify as *baccha* species of genus Chrysis but, *baccha* species belongs to genus *Chrysura* according to Linsenmaier 1968.

Diagnosis: Body length about 7 mm (Figure 4.10 G); F-I 3 time as long as F-II or F-III; falgellomers F-II-V of male bulging and asymmetrical, F-I l/w about 4 (Figuree 4.10 B); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded (Figuree 4.10 A); pronotum shorter than scutellum (Figuree 4.10 D); pit row weak not deep (Figuree 4.10 F); S-II spots large, oval and well separated (Figuree 4.10 E); apex of T-III without teeth (Figuree 4.10 F); fore wing discoidal cell complete (Figuree 4.10 G); propodeal angle subtriangular (Figuree 4.10 D). Colaration: Antennae brown, but pedicel, scape and F-I are metallic green (Figuree 4.10 B); face, vertex, head, gena area, pronotum, mesoscutum, mesoscutellum, tegula, metanotum, propodeum, T-I, T-II, T-III (abdomen) are green with cuppery reflection, (Figuree 4.10 G); coxa, femur, tibia are metallic green (Figuree 4.10 D, A); metasomal sternites metallic green (Figuree 4.10 E).

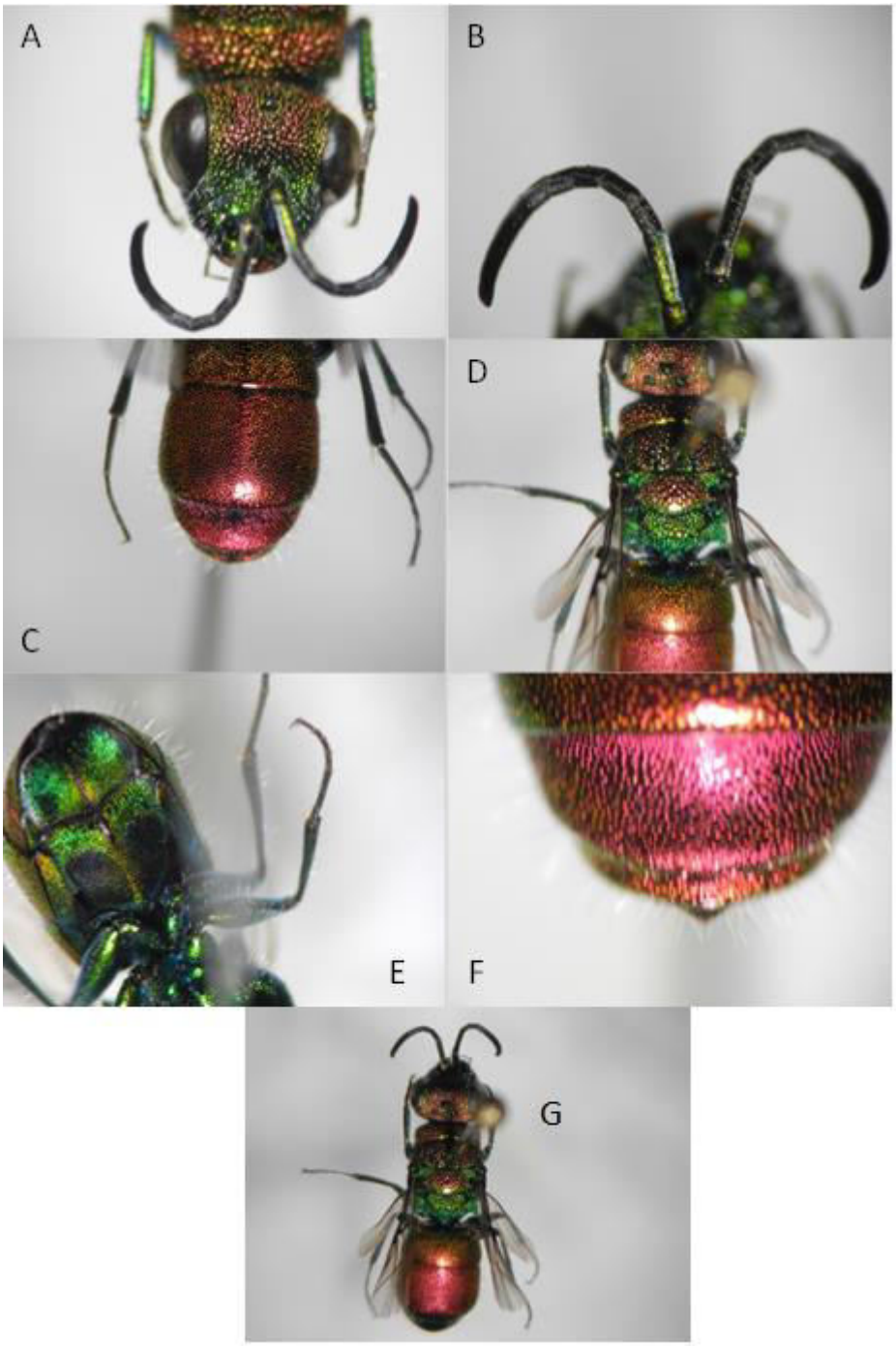


Figure 4.10. *Chrysura baccha* (Balthasar, 1953) (Male): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.1.9. Species: *Chrysura laevigata* (Abeille de Perrin, 1879)

Material examined: 1♀, 1♀, Genç, 38°44'57" N 40°31'35" E, 997 m, 15.V.2016.

Distribution: Azarbaijan, Cyprus, Greece, Iran, USSR, Palestine, Turkey and Yugoslavia (Kimsey and Bohart 1991; Rosa et al. 2013).

Distribution in Turkey: Not detailed locality (Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 5.5 mm (Figure 4.11 G); F-I 3 time as long as F-II or F-III; falgellomers F-II-V of male bulging, F-I l/w 4 (Figure 4.11 B); face flat with no medial zone, no TFC, malar space about 2.5 MOD, mid ocellus not lidded (Figure 4.11 A); pronotum shorter than scutellum (Figure 4.11 G); pit row weak, apex of T-III without teeth (Figure 4.11 C, F); fore wing discoidal cell complete (Figure 4.11 C); propodeal angle subtriangular (Figure 4.11 D); S-II spots oval seperated (Figure 4.11 E). Colaration: Antennae dark brown, but pedicel, scape are metallic green (Figure 4.11 B); face blue green reflection (Figure 4.11 A); vertex head green-golden, gena area blue (Figure 4.11 B); tegula, pronotum, mesoscutum, mesoscutellum are green–golden metanotum, propodeum, are blue, (Figure 4.11 G); T-I green-golden, T-II, T-III are red (Figure 4.11 C); but coxa, femur, tibia are metallic green (Figure 4.11 G); metasomal sternites metallic green (Figure 4.11 E).

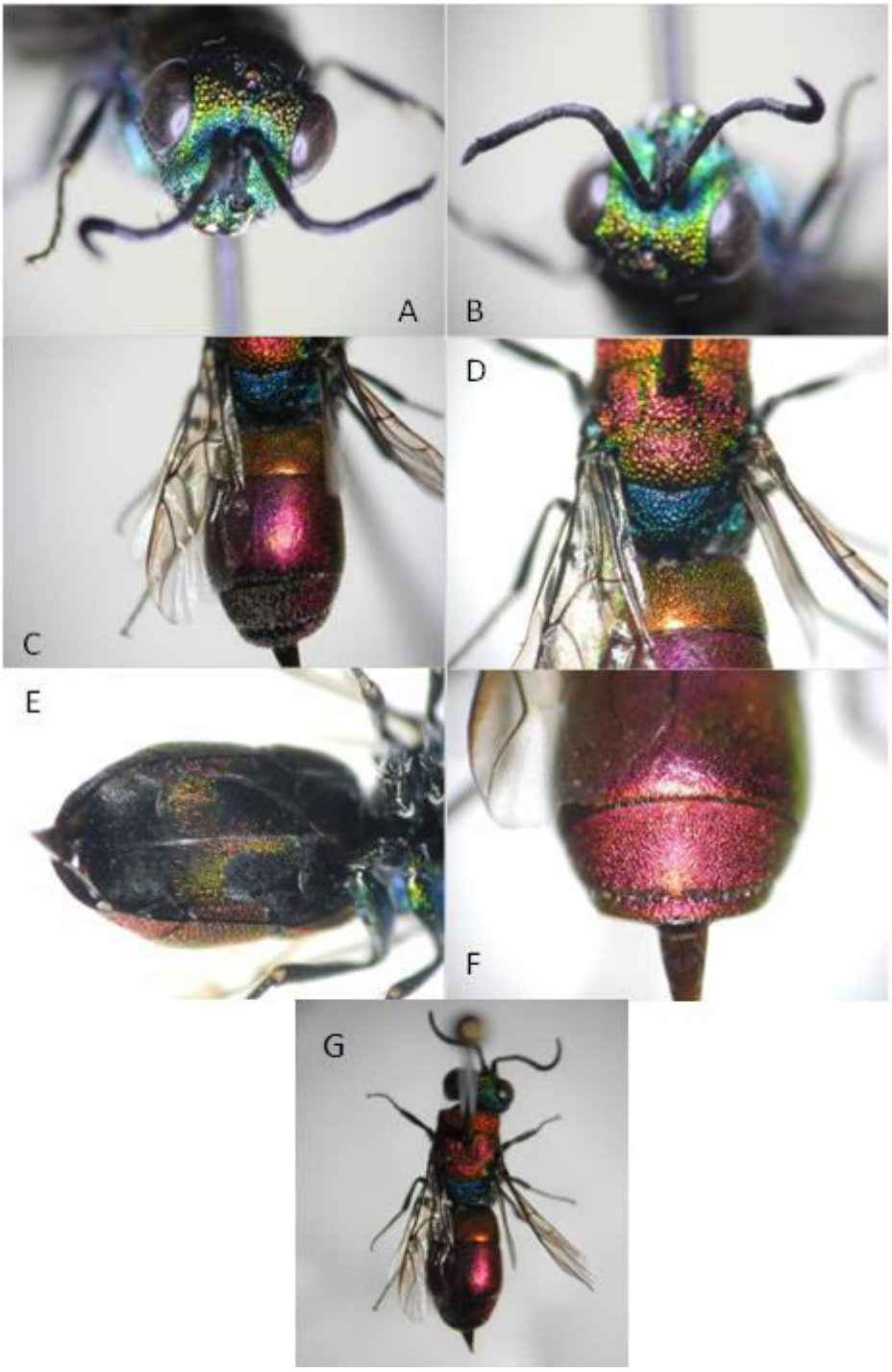


Figure 4.11. *Chrysura laevigata* (Abeille de Perrin, 1879) (Female): A) Head, frontal view B) Head, dorsal view C) Abdomen dorsal view D) Thorax dorsal view E) Metasomal sternites, ventral view F) Apex T-III dorsal view G) Dorsal overview

4.3.2. Genus: *Chrysidea* Bischoff, 1910

The head of genus *Chrysidea* (Bischoff, 1910) wider than long; face has upper TFC, (occasionally quite weak). Scapal basin microridged roundly excavated and crowned by special convex or biconvex. Three visible tergite; T-III without teeth and not rim but, angled from sides this feature is unique for this genus. Genus *Chrysidea* (Bischoff, 1910) abundant. The size species of *Chrysidea* (Bischoff, 1910) are not big about 4-6 mm (Kimey and Bohart 1991).

4.1.3.2.1. Species: *Chrysidea pumila* (Klug, 1845)

Material examined: 1♂, Bingöl center, 38°54'24" N 40°30'20", 1113 m, 14.VIII.2016; 1♂, Ilıcalar 38°59'18" N 40°40'30" E,1171 m, 14.VIII.2016; 1♀, 38°54'50" N 40°31'16" E, 1170 m, 05.IV.2016.

Distribution: Azarbaijan, Iran, Turkey and USSR (Kimsey and Bohart 1991; Rosa et al. 2013; Farhad et al. 2016; Farzaneh et al. 2017).

Distribution in Turkey: Erzincan, Erzurum and Istanbul (Strumia and Yıldırım 2007, Yıldırım and Strumia 2006b).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 4mm (Figure 4.12 G); head broader than long, TFC weak and upper (Figure 4.12 A); subantennal and malar space about 1MOD, F-I longer than F-II, or F-III (Figure 4.12 B); mid ocellus not lidded, subgenal area well defined, discoidal cell with outer veins (Figure 4.12 F); T-III posterolateral angle not sharp, apical margin of T-III with lateral tooth (Figure 4.12 D); pit row visible (Figure 4.12 C) and S-II round (Figure 4.12 E). Coloration: entirely body blue with green reflection (Figure 4.12 G).

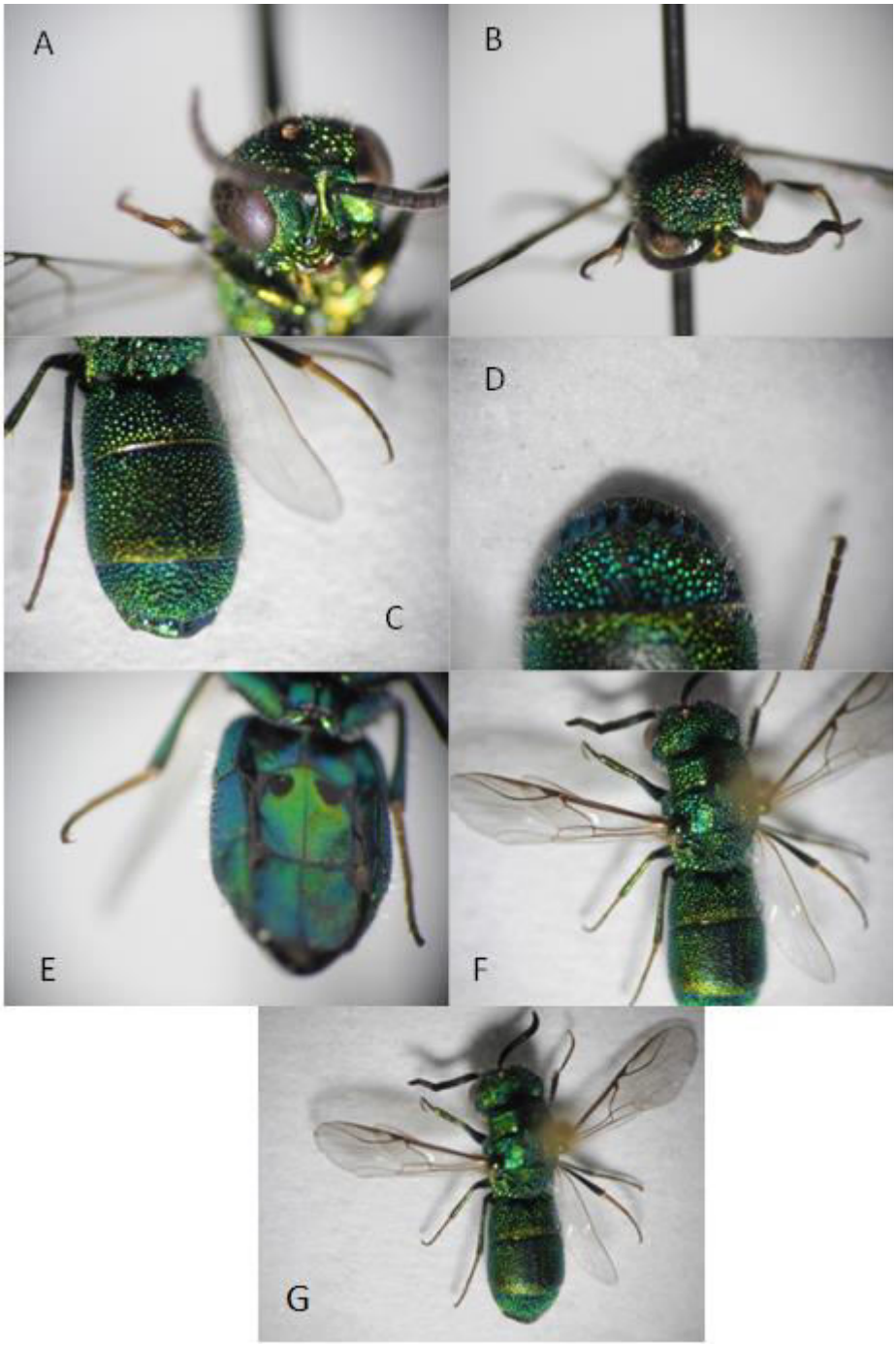


Figure 4.12. *Chrysidea pumila* (Klug, 1845) (Male): A) Head, antennae, dorsal view B) Head, pronotum, dorsad view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Head, legs, thorax and abdomen dorsal view G) Dorsal overview

4.3.3. Genus: *Chrysis* Linnaeus, 1761

The genus Chrysis includes about 1000 currently identified species and is as big as all of the rest of the Chrysididae together. Forward with the size of the genus there is a huge amount of variation. Chrysis is best known by a combination of numerous, non-exclusive characters, many of which are exist throughout the genus. For example, all Chrysis have the fore wing marginal cell attenuate and, if elongated by creases, terminating on the front wing margin.

Key to Species of *Chrysis*

1-Posterior margin of T3 with four distinct teeth or angular prominences…….…….2
-Posterior margin of T3 medially pointed or rounded without teeth……..……7
2-Lateral edge of abdomen angular…….....….……..3
-Lateral edge of abdomen not angular……..…….4
3-Abdominal teeth sharp…….……...…. *Chrysis cerastes*
-Abdominal teeth not sharp……..*Chrysis ambigua*
4-Subantennal space nearly 1 MOD……...…….5
-Subantennal space nearly 1.5 MOD …….……..……6
5-All four teeth, sharp, distinct and closed together …….. *Chrysis inaequalis*
-Only medial teeth, sharp, distinct and closed together….……....…. *Chrysis concolor*
6-Abdomen metallic blue with green reflection ….……...…..…. *Chrysis ragusae*
-Abdomen with blue with green reflection ….……..... *Chrysis mirabilis*
7-TFC dim ….……...…….…… *Chrysis ciliciensis*
-TFC visible.…… ……....…….……8
8-Subantennal space nearly 2 MOD.……. …….9
-Subantennal space nearly less 2 MOD……... ……...……10
9-Apex of T-III notched….……..…….. *Chrysis bilobata*
-Apex of T-III not notched…..……...…….*Chrysis rubricate*
10-Abdomen green with golden reflection with deep and big pit row……..... *Chrysis coa*
-Abdomen green with deep and small pit row …..……..…….*Chrysis shousboei*

4.3.3.1. Species: *Chrysis cerastes* Abeille, 1877

Material examined: 2♀♀, Genç, 38°44'57" N 40°31'35" E, 997 m, 11.VIII.2016.

Distribution: France and Greece (Strumia 1981; Kimsey and Bohart 1991).

Distribution in Turkey: Erzurum, Kars and Tokat (Strumia and Yıldırım 2007; Yıldırım and Strumia 2006b).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 8 mm (Figure 4.13 G); F-I l/w 1.5 in male, but in female about 2.5, F-I l/w male longer than F-II but shorter than F-III, a little micro ridging, TFC strong and sharp, malar space about 1.7 MOD, subantennal space nearly 1.5 MOD (Figure 4.13 A); pit row well developed, apex of T-III with four sharp teeth, lateral side simple (Figure 4.13 C and F); S-II spots large elongate oval shape and fine separated each other (Figure 4.13 E). Coloration: Antennae black, but pedicel and scape are metallic green, (Figure 4.13A); face, vertex head, gena are blue (Figure 4.13 A); pronotum, mesoscutum, mesoscutellum, metanotum, propodeum are blue with green reflection (Figure 4.13 B); coxa, femur, tibia are metallic green (Figure 4.13 G); T-I green, T-II and T-III are green-golden (Figure 4.13 D and F); and metasomal sternites metallic green (Figure 4.13 E).

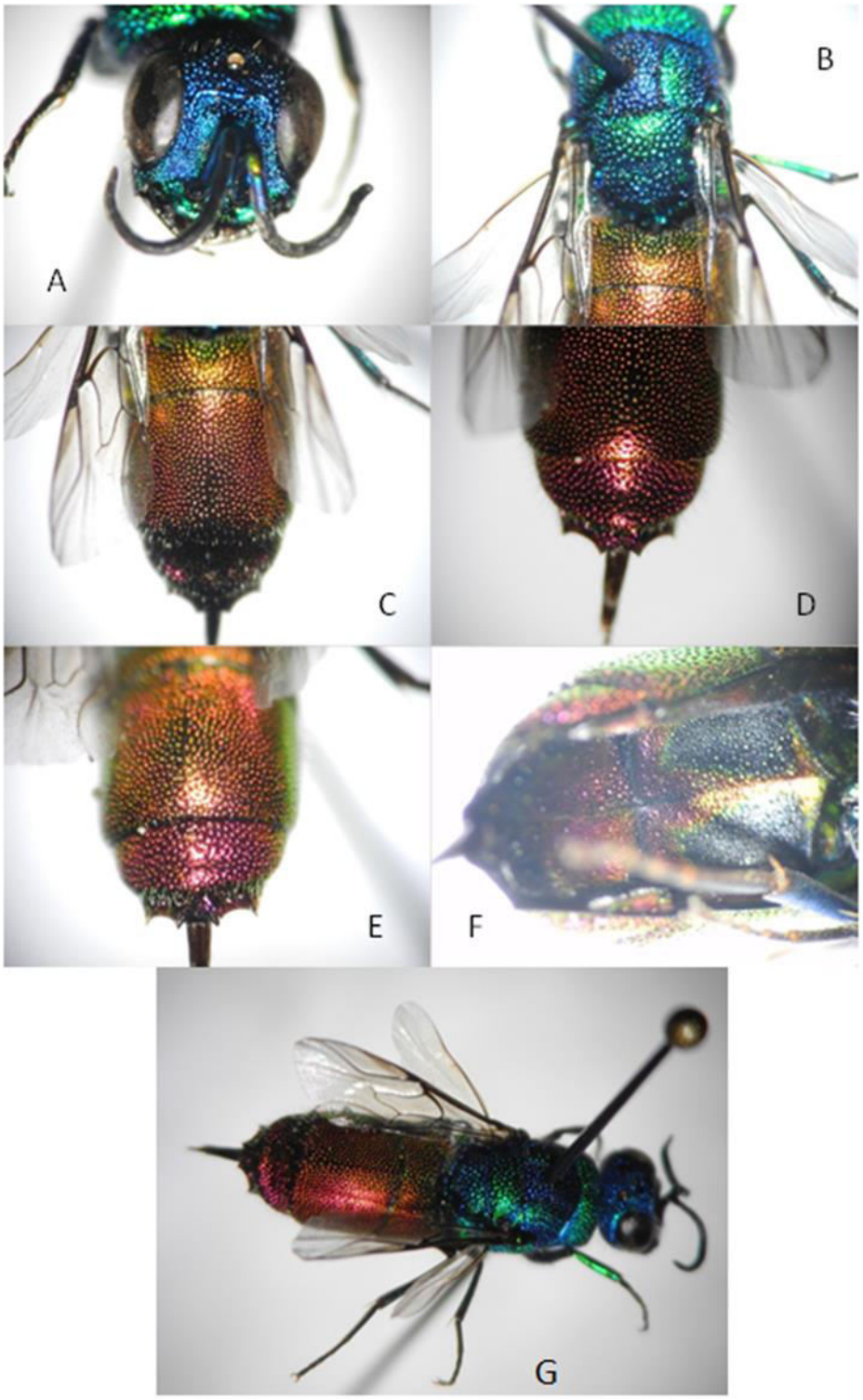


Figure 4.13. *Chrysis cerastes* Abeille, 1877 (Female): A) Head, antennae, frontal view B) Thorax, dorsal view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Apex T-III, dorsal view G) Dorsal overview

4.3.3.2. Species: ***Chrysis ambigua*** Radoszkowski, 1891

Material examined: 1♂, 1♀, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.2016; 2♂♂, Ilıcalar, 38°59'18" N 40°40'30" E, 1171 m, 15.VIII.2016.

Distribution: Gereece, Iran, Palestine, Turkmenistan, Turkey and USSR (Linsenmaier 1959; Kimsey and Bohart 1991; Rosa et al. 2013).

Distribution in Turkey: Antakya, Denizli, Erzurum, Içel, Isparta, Karaman, Konya and Şanlıurfa (Strumia and Yıldırım 2007; Wisniowski and Strumia 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 6 mm (Figure 4.14 G); F-I, F-II shorter than F-III; F-I l/w near 2 in male (Figure 4.14 B); TFC strong, sharp and near M-like, malar space near 2 MOD, subantennal space about 1.5 MOD (Figure 4.14 A); pit row well evolved, apex of T-III with four teeth, lateral edge not simple (Figure 4.14 C); S-II spots large, circle and separated (Figure 4.14 E). Coloration: Antennae black, but pedicel and scape are metallic green (Figure 4.14 B); face, mandible, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum are blue with green reflection (Figure 4.14 A, F); coxa, femur, tibia are metallic green, T-I, T-II and T-III (abdomen); are green-golden (Figure 4.14 D); metasomal sternites metallic (Figure 4.14 E).

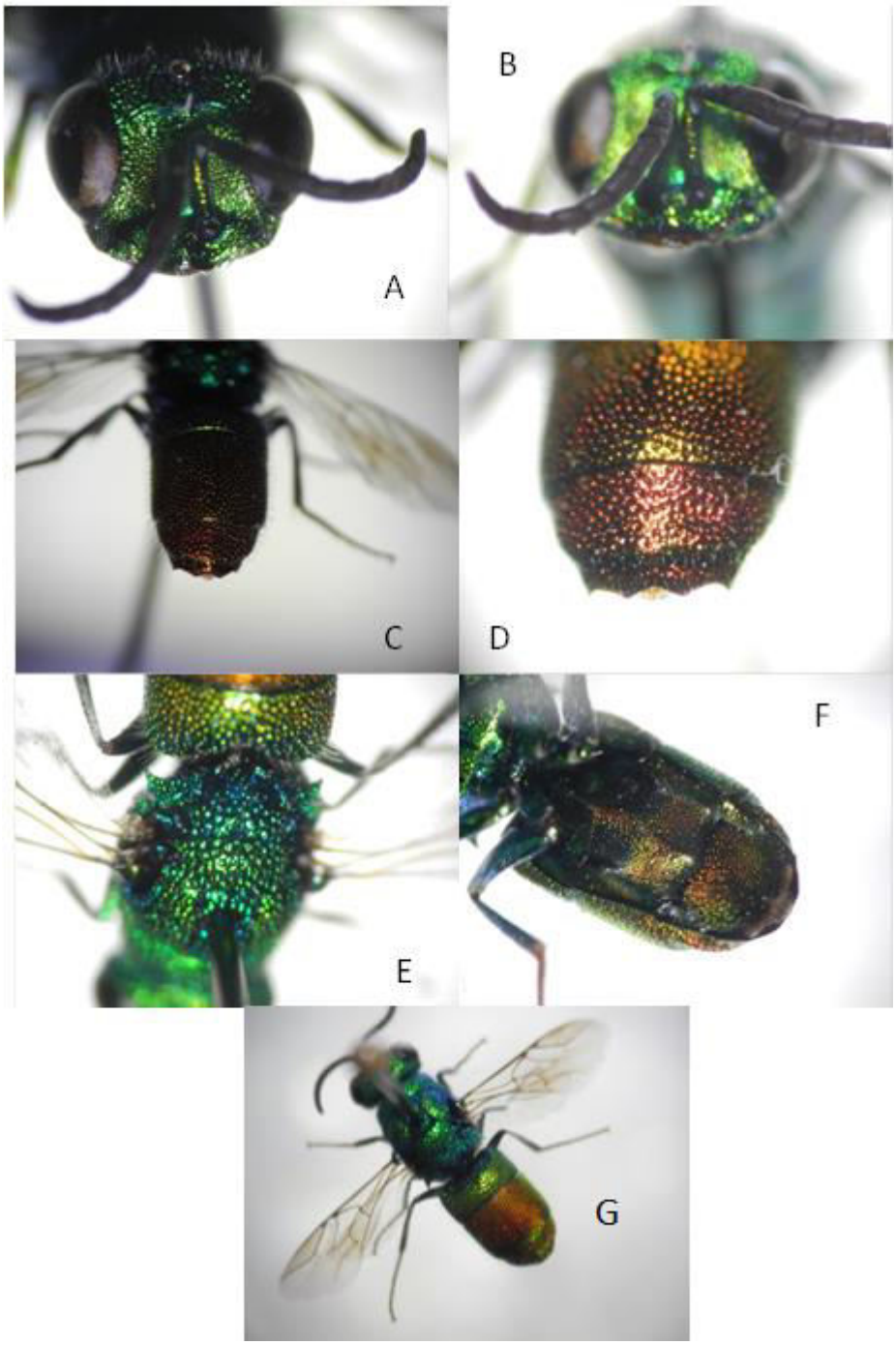


Figure 4.14. *Chrysis ambigua* Radoszkowski, 1891 (Male): A)Head, antennae, dorsal view B) Head, pronotum, dorsad view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Head, legs, thorax and abdomen dorsal view G) Dorsal overview

4.3.3.3. Species: *Chrysis inaequalis* Dahlbom, 1845

Material examined: 1♀, 1♂ Bingöl center, 38°54'50" N 40°31'16" E, 1042 m, 17.VII.2016.

Distribution: China, Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, Russia and Turkey (Kimsey and Bohart 1991; Wisniowski and Strumia 2007; Rosa et al. 2013).

Distribution in Turkey: Erzincan, Erzurum, Kars, Mersin and Rize (Yıldırım and Strumia 2006b; Wisniowski and Strumia 2007; Farzaneh et al. 2017).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length about 6mm (Figure 4.15 G); malar space 2 MOD, supantennal space 1 MOD (Figure 4.15 A); F-I l/w nearly 3.5, F-I 2 time longer than F-II; 2.5 than F-III (Figure 4.15 B); face hollow and deep (Figure 4.15 A); propodeal angle large, mesopleuron bidentate and bulging (Figure 4.15 A); TFC fine projecting (Figure 4.15 A); T-III with well-developed pit row; T-III apex with four sharp teeth close together, lateral edge covex in basal fourth (Figure 4.15 C); S-II spots indisttinct and basal fused (Figure 4.15 E). Colaration: Antennae balck (Figure 4.15 B); vertex head, gena, pronotum, mesoscutum, mesoscutellum, propodeum and metanotum blue with green reflection (Figure 4.15 D, G); coxa, femur, tibia are metallic green (Figure 4.15 G) and abdomen entirely metallic green (Figure 4.15 C, D, F).

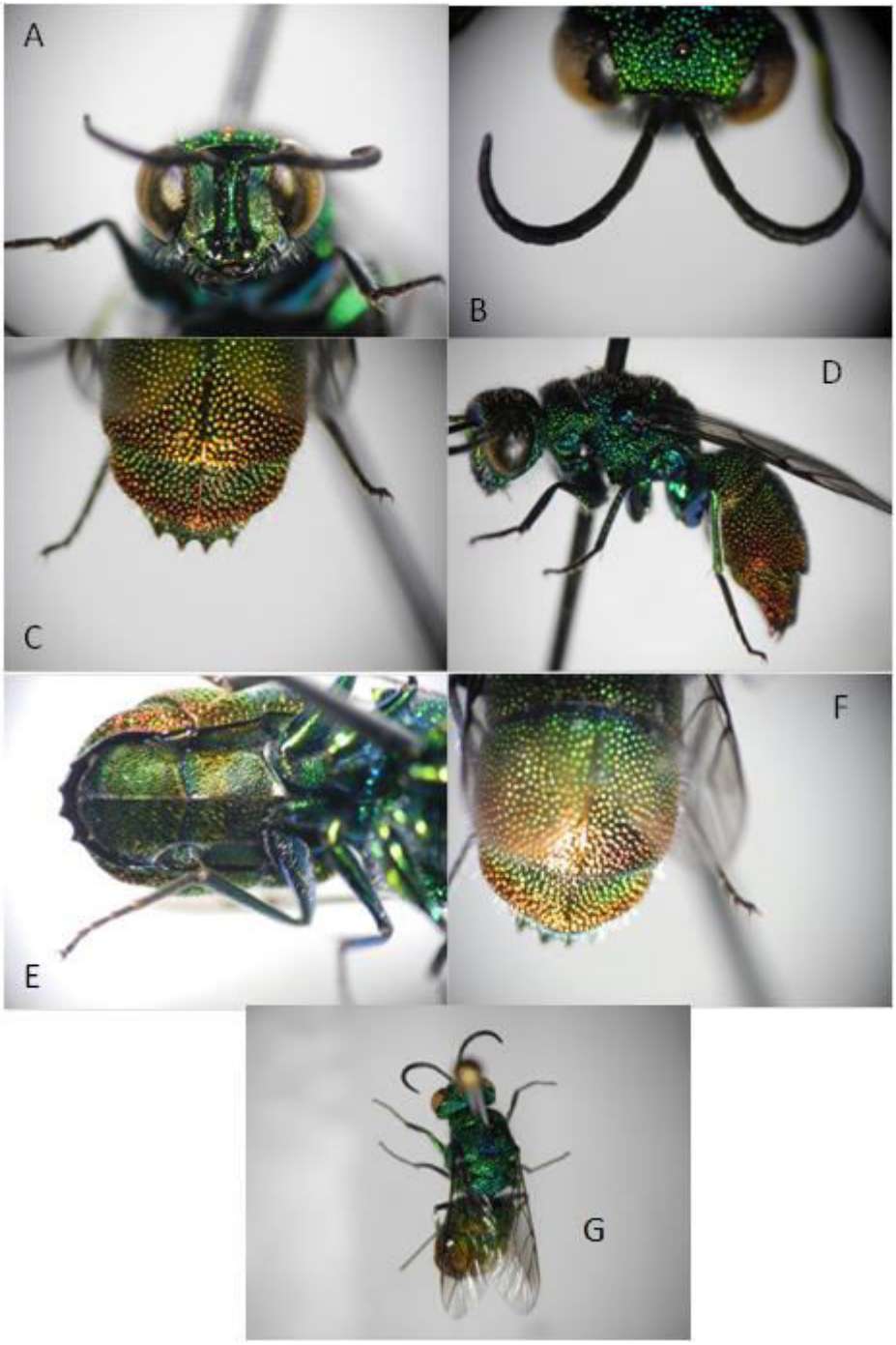


Figure 4.15. *Chrysis inaequalis* Dahlbom, 1845 (Male): A) Head, antennae, frontal view B) Thorax, dorsal view C) T-III, T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Pronotum, head dorsal view G) Dorsal overview

4.3.3.4. Species: *Chrysis concolor* Mocsáry, 1893

Material examined: 3♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 22.VIII.2016.

Distribution: Azarbaijan, Iran, Palestine, USSR, Japan and Turkey (Linsenmaier 1968, 1987, 1997; Kimsey and Bohart 1991; Rosa et al. 2013; Farhad et al. 2015).

Distribution in Turkey: Erzincan and Erzurum (Yıldırım and Strumia 2006b).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 4 mm (Figure 4.16 G); F-I 2 time as long as F-II or F-III; F-I l/w near 4 (Figure 4.16 B); TFC distinct, malar space about 1.5 MOD, subantennal space nearly 1 MOD (Figure 4.16 A); pit row well developed, a pex of T-III with four teeth, lateral edge simple (Figure 4.16 C); S-II spots indistinct (Figure 4.16 E). Colaration: Antennae balck, but pedicel and scape, are metallic green (Figure 4.16 A and B); face, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum, T-I, T-II, T-III are blue with green reflection, (Figure 4.16 F, A, B, D and G); coxa, femur, tibia are metallic green, (Figure 4.16 G); metasomal sternites not metallic (Figure 4.16 E).

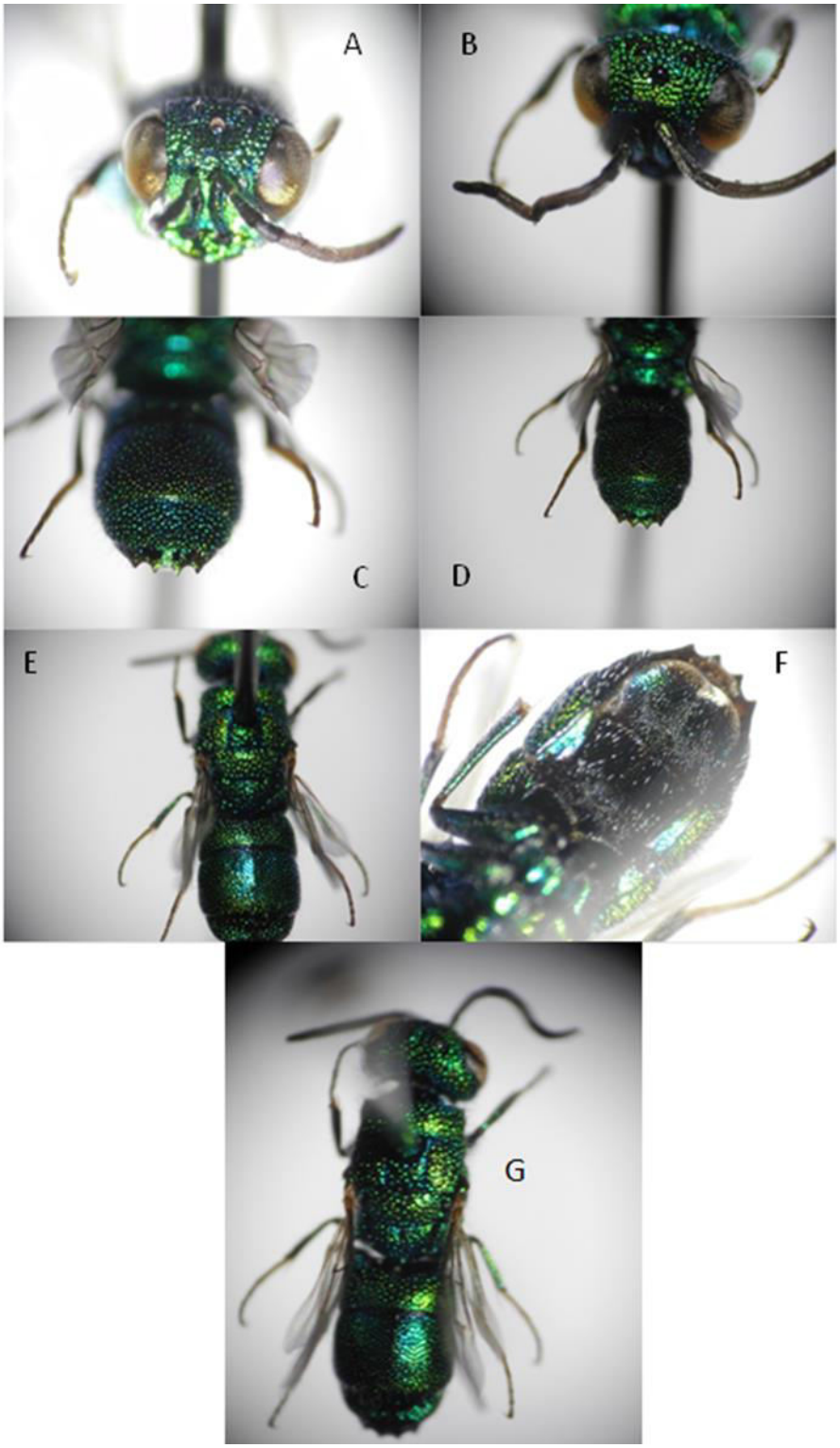


Figure 4.16. *Chrysis concolor* Mocsáry, 1893 (Male): A) Head, antennae, frontal view B) Thorax, dorsal view C) T-III, T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Pronotum, head dorsal view G) Dorsal overview

4.3.3.5. Species: *Chrysis ragusae* De-Stefani, 1888

Material examined: 2♂♂, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.2016.

Distribution: Bulgaria, Croatia, Greece, Hungary, Italy, Turkey and USSR (Kimsey and Bohart 1991).

Distribution in Turkey: Antakya, Denizli, Erzurum, Konya and Mersin (Strumia and Yıldırım 2007, 2011; Wisniowski and Strumia 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 4 mm (Figure 4.17 G); F-I three time longer than F-II or F-III; F-I l/w near 4 (Figure 4.17 B); TFC distinct, malar space about 2 MOD, subantennal space nearly 1.5 MOD (Figure 4.17 A); pit row well developed, apex of T-III with four teeth, but tooth 2 and tooth 3 are longer, lateral edge angle (Figure 4.17 C,D); S-II spots indistinct (Figure 4.17 F). Colaration: Antennae balck, but pedicel and scape, are metallic (Figure 4.17 B); face, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum, tegula, T-I, T-II, T-III are blue with green reflection (Figure 4.17 D, E); coxa, femur, tibia are metallic green (Figure 4.17 G); metasomal sternites metallic (Figure 4.17 F).

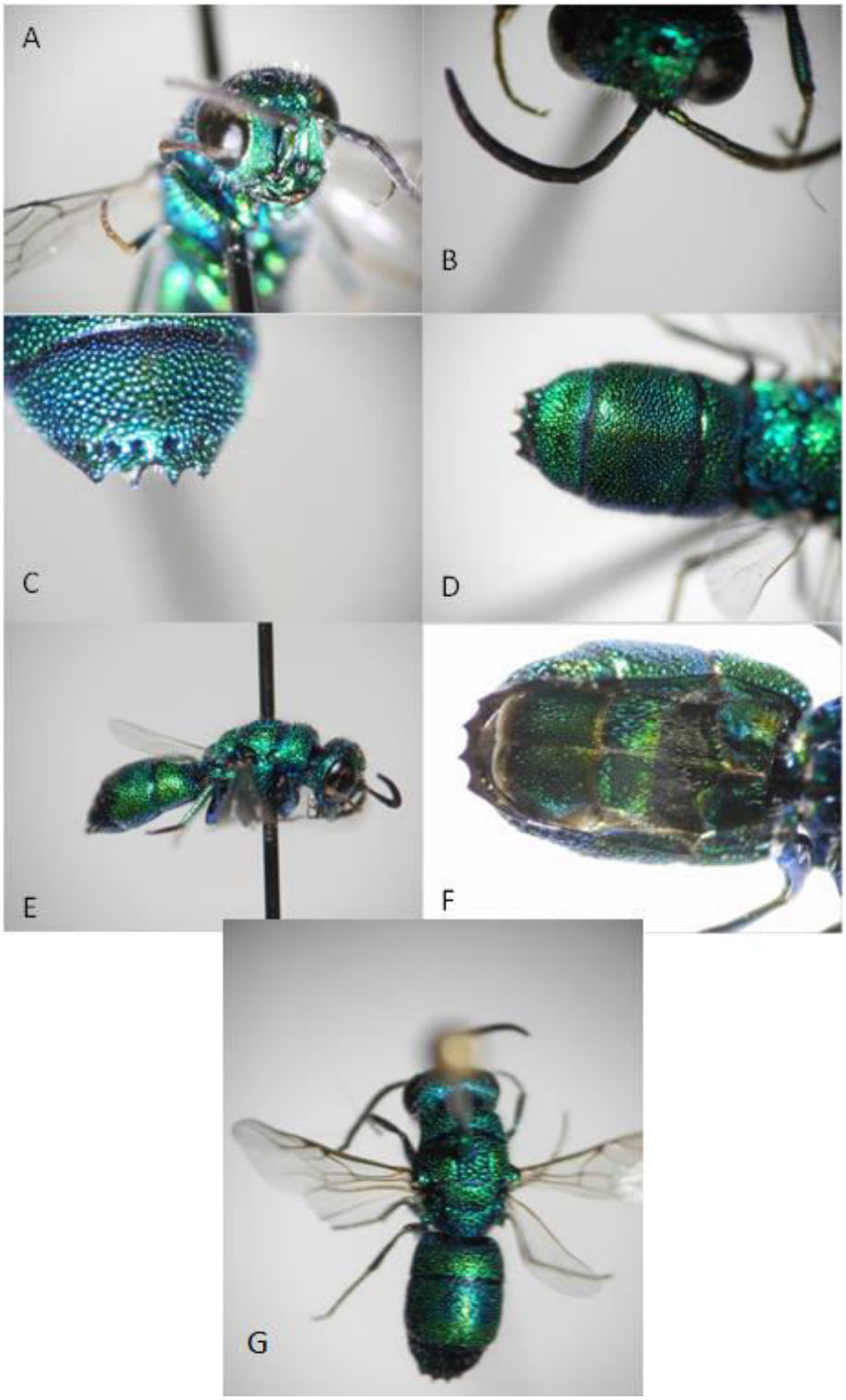


Figure 4.17. *Chrysis ragusae* De-Stefani, 1888 (Male): A) Head, frontal view B) Antennae, dorsal view C) T-III dorsal view D) Metasoma, dorsal view E) Body lateral view; F) Metasomal sternites, ventral view G) Dorsal overview

4.3.3.6. Species: ***Chrysis mirabilis*** Radoszkovsky, 1877

Material examined: 2♂♂, Bingöl center, 38°54'24" N 40°30'20" E, 1113 m, 14.V.2016.2♂♂, 1♀, Genç, 38°44'57" N 40°31'35" E, 997 m, 15.V.2016.

Distribution: Greece, Turkey and USSR (Kimsey and Bohart 1991).

Distribution in Turkey: Erzurum and Rize (Strumia and Yıldırım 2007; Yıldırım and Strumia 2006b; Wisniowski and Strumia 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 5.5 mm (Figure 4.18 G); F-I 2 time as long as F-II or F-III; F-I l/w near 3.5 (Figure 4.18 A); TFC distinct, malar space about 2 MOD, subantennal space nearly 1.5 MOD (Figure 4.18 B); pit row well developed, apex of T-III with four teeth, lateral edge angle (Figure 4.18 C,D); S-II spots indistinct (Figure 4.18 E). Colaration: Antennae balck, but pedicel and scape, are metallic (Figure 4.18 A,B); face green, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum, tegula are blue with green reflection (Figure 4.18 F and 4.18 G); T-I, T-II, T-III are green (Figure 4.18 C); coxa, femur, tibia are metallic green (Figure 4.18 F and 4.18 G); metasomal sternites metallic green (Figure 4.18E).

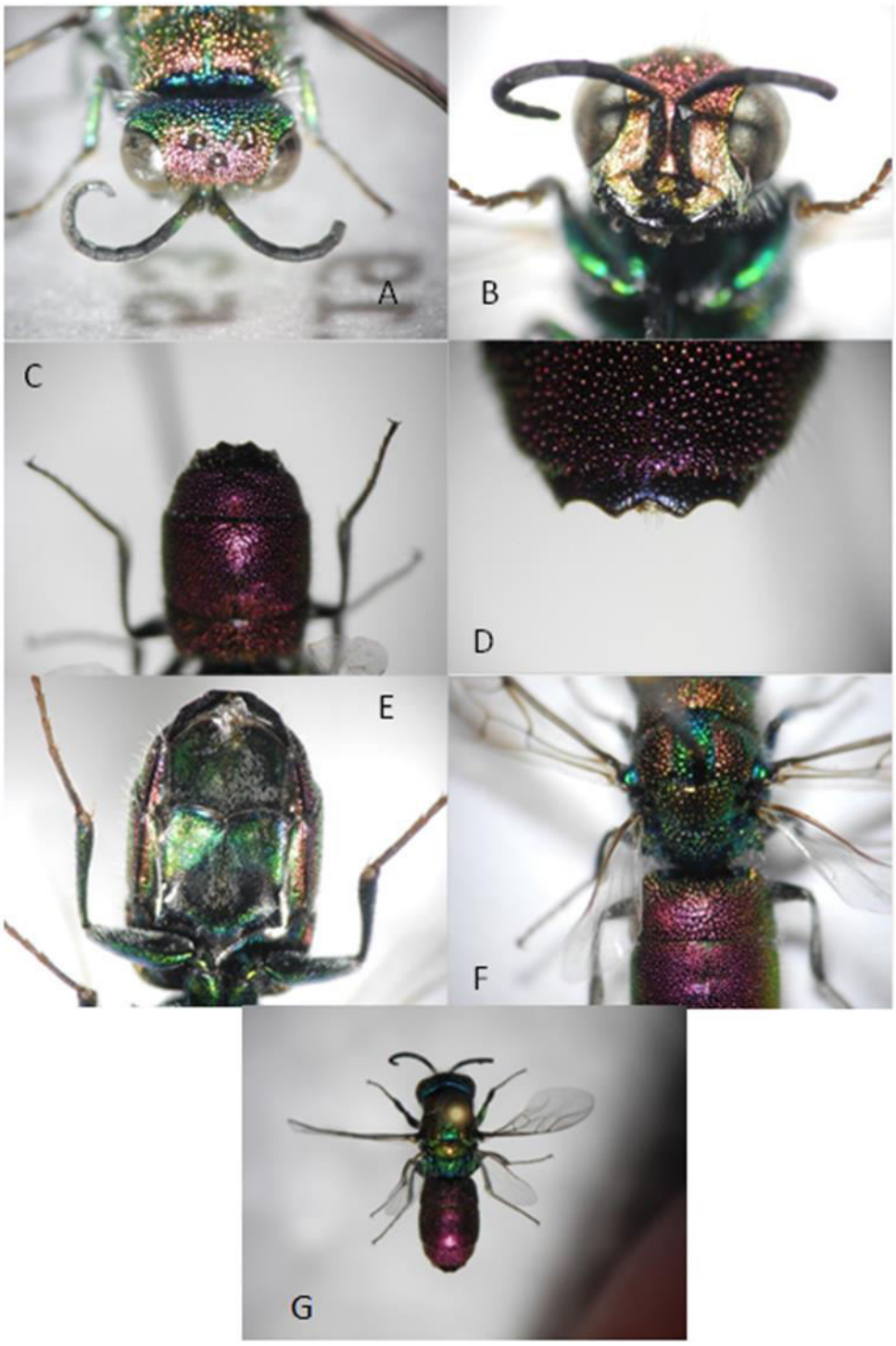


Figure 4.18. *Chrysis mirabilis* Radoszkovsky, 1877 (Male): A) Head, antennae, pronotum dorsal view B) Head, frontal view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Thorax, T-I, T-II dorsal view G) Dorsal overview

4.3.3.7. Species: *Chrysis ciliciensis* Mocsáry, 1914

Material examined: 2♂♂, 2♀♀, Bingöl center, 38°54'50" N 40°31'16" E, 1042 m, and 17.VII.2016.

Distribution: Yugoslavia (Kimsey and Bohart 1991).

Distribution in Turkey: Adıyaman, Antalya, Bilecik, Erzurum and Şanlıurfa (Arens 2001, 2002; Strumia and Yıldırım 2007).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 6 mm (Figure 4.19 G); F-I two time longer than F-II or F-III; F-I l/w near 3.5 (Figure 4.19 A); TFC dim, malar space near 2 MOD, subantennal space about 1.5 MOD (Figure 4.19 A and F); pit row not well evolved, apex of T-III without teeth, lateral side simple (Figure 4.19 C and D); S-II spots large, circle and separated (Figure 4.19 E). Coloration: Antennae black, but pedicel and scape, F-I, are metallic green, face, mandible (Figure 4.19 A and F); vertex head, pronotum, mesoscutum green, gena area, tegula, mesoscutellum, are blue with green reflection,(Figure 4.19 G) and (Figure 4.19 D); metanotum, propodeum are blue (Figre 4.19 B); coxa, femur, tibia are metallic green,(Figure 4.19 G); T-I green, but T-II and T-III are red (Figure 4.19 D,G); metasomal sternites metallic (Figure 4.7 E).

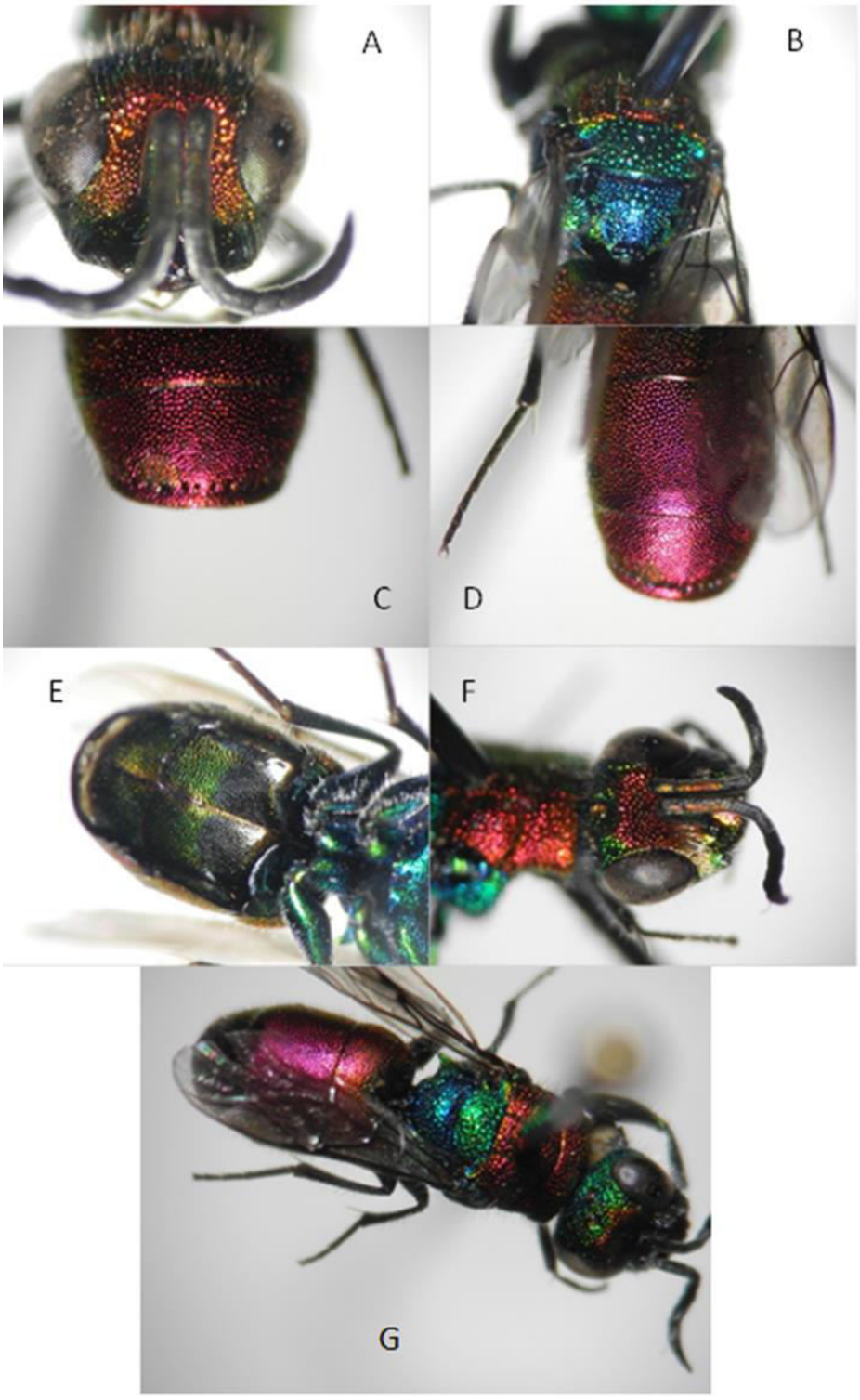


Figure 4.19. *Chrysis ciliciensis* Mocsáry, 1914 (Male): A) Head, antennae, frontal view B) Thorax, dorsal view C) T-III,T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Pronotum, head dorsal view G) Dorsal overview

4.3.3.8. Species: *Chrysis bilobata* Balthasar, 1953

Material examined: 2♀♀, Genç, 38°44'57" N 40°31'35" E, 997 m, 15.VIII.2016.

Distribution: Algeria, Jordan, Iran, Libanon, Syria (Kimsey and Bohart 1991; Strumia and Fallahzadeh 2015).

Remark: This species is a new record for the Turkish fauna.

Diagnosis: Body length 4 mm (Figure 4.20 G); F-I two time longer than F-II or F-III; F-I l/w near 2 (Figure 4.20 A); eyes huge, TFC weak, malar space not wide near 1 MOD, subantennal space about 2 MOD (Figure 4.20 B); pit row not well evolved, apex of T-III without teeth, lateral edge simple (Figure 4.20 C,D); S-II spots dim (Figure 4.20 E). Colaration: Antennae balck, but pedicel and scape are green (Figure 4.20 A) face, mandible, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum are green (Figure 4.20 B, C, D and F); coxa, femur, tibia are metallic green (Figure 4.20 G) T-I, T-II and T-III (abdomen) are green (Figure 4.20 D and F); metasomal sternites not metallic (Figure 4.20 E).

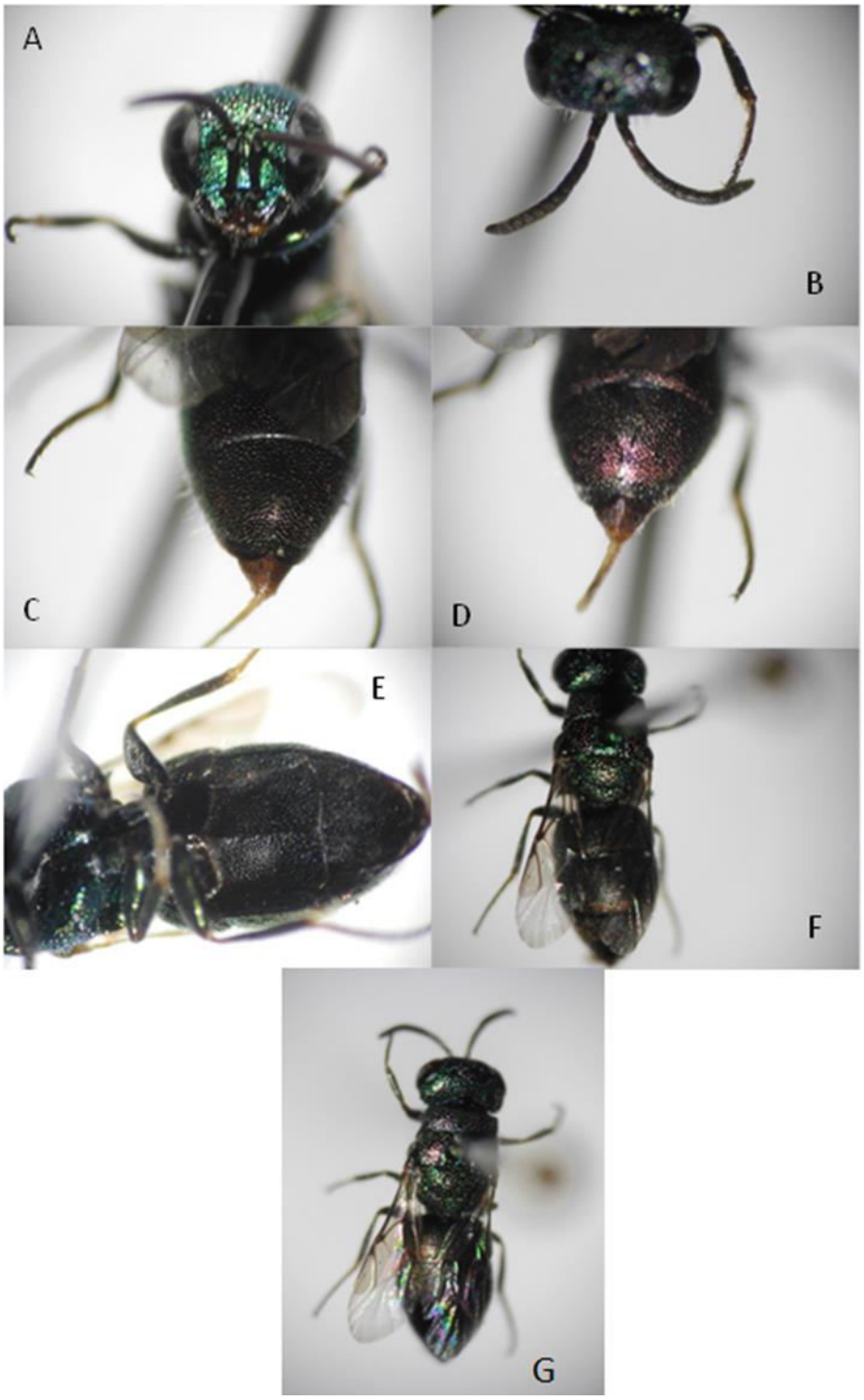


Figure 4.20. *Chrysis bilobata* Balthasar, 1953 (Female): A) Head, antennae, dorsal view B) Head, frontal view C) T-III,T-II dorsal view; D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Head, legs, thorax and abdomen dorsal view G) Dorsal overview

4.3.3.9. Species: *Chrysis rubricata* Mocsáry, 1902

Material examined: 3♂♂, Bingöl center, 38°54'24" N 40°30'20" E, 1145 m, 25.VIII. 2016; 2♂♂, Genç, 38°44'57" N 40°31'35" E, 997 m, 1-15.VIII.2016; 2♂♂, 1♀, Solhan, 38°57'17" N 40°58'13" E, 1280 m, 17.V.2016.

Distribution: Azarbaijan, Egypt, Iran Libya and Tunisia (Kimsey and Bohart 1991; Rosa et al. 2013).

Remark: This species is a new record for the Turkish fauna.

Diagnosis: Body length 5 mm (Figure 4.21 G); face medially micro ridged, TFC weak M–like, malar space about 3.5 MOD, subantennal space near 2MOD (Figure 4.21 A, B); T-III pit row fine and well developed, apex of T-III without teeth (edentate); lateral edge simple (Figure 4.21 C, D); S-II spots semicircular and fused together (Figure 4.21 F). Colaration: Antennae balck, but pedicel and scape, are metallic (Figure 4.21 B); vertex green, gena blue, pronotum green, mesoscutum green (Figure 4.21 E); but meddile blue, mesoscutellum, metanotum, propodeum are blue, coxa, femur, tibia of forelegs are metallic green but, coxa, femur, tibia of hind legs blue (Figure 4.21 G); pit row blue T-I green (Figure 4.21 C); T-II and T-III are red (Figure 4.21 D); metasomal sternites not metallic (Figure 4.21 F).

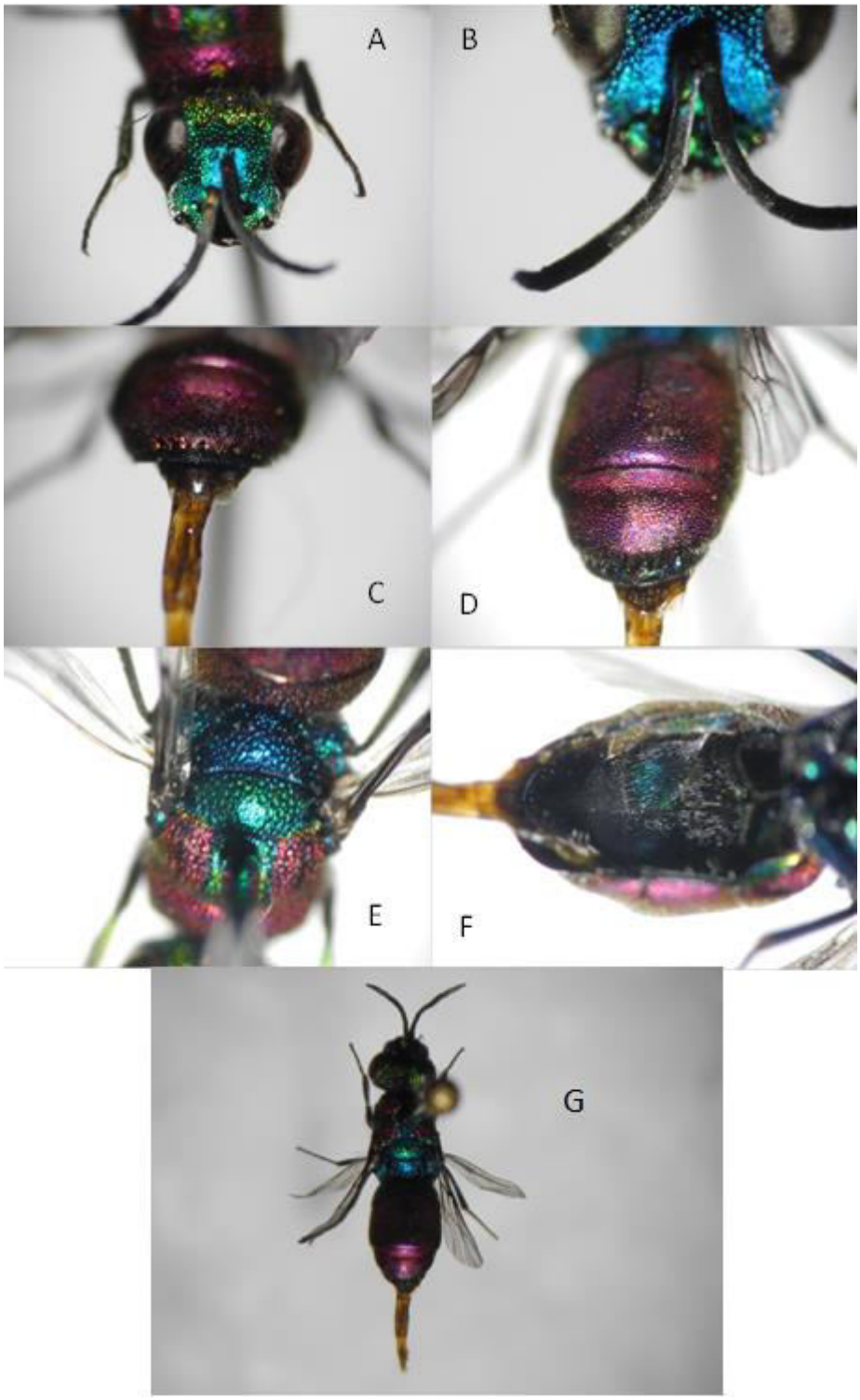


Figure 4.21. *Chrysis rubricata* Mocsáry, 1902 (Female): A) Head, frontal view B) Antennae, dorsal view C) Apex T-III dorsal view D) Metasoma, dorsal view E) Thorax dorsal view F) Metasomal sternites, ventral view G) Dorsal overview

4.3.3.10. Species: *Chrysis coa* Invrea, 1939

Material examined: 2♂♂, Genç 38°44'57"N 40°31'35"E, 997 m, 22.VIII.2016; 1♀, Kigı, 39°19'01" N 40°40'21",1702 m, 06.VIII.2016.

Distribution: USSR, Greece, Iran, Italy (Kimsey and Bohart 1991; Strumia and Fallahzadeh 2015).

Remark: This species is a new record for the Turkish fauna.

Diagnosis: Body length 7 mm (Figure 4.22 G); F-I three time longer than F-II or two than F-III; F-I l/w near 2 in male, but in female about 3 (Figure 4.22 A); TFC strong and sharp M-like, malar space about 1.5 MOD, subantennal space nearly 1 MOD (Figure 4.22 C); pit row well developed, a pex of T-III without teeth, lateral edge simple, (Figure 4.22 D); S-II spots large and fused together (Figure 4.22 E). Colaration: Antennae black, pedicel and scape, are metallic green (Figure 4.22 A and C); face, vertex head, gena area, pronotum, mesoscutum, mesoscutellum, metanotum, propodeum are blue with green reflection (Figure 4.22 F); coxa, femur, tibia are metallic green, (Figure 4.22 G); T-I green, T-II and T-III (abdomen); are green-golden, (Figure 4.22 B); metasomal sternites metallic (Figure 4.22 E).

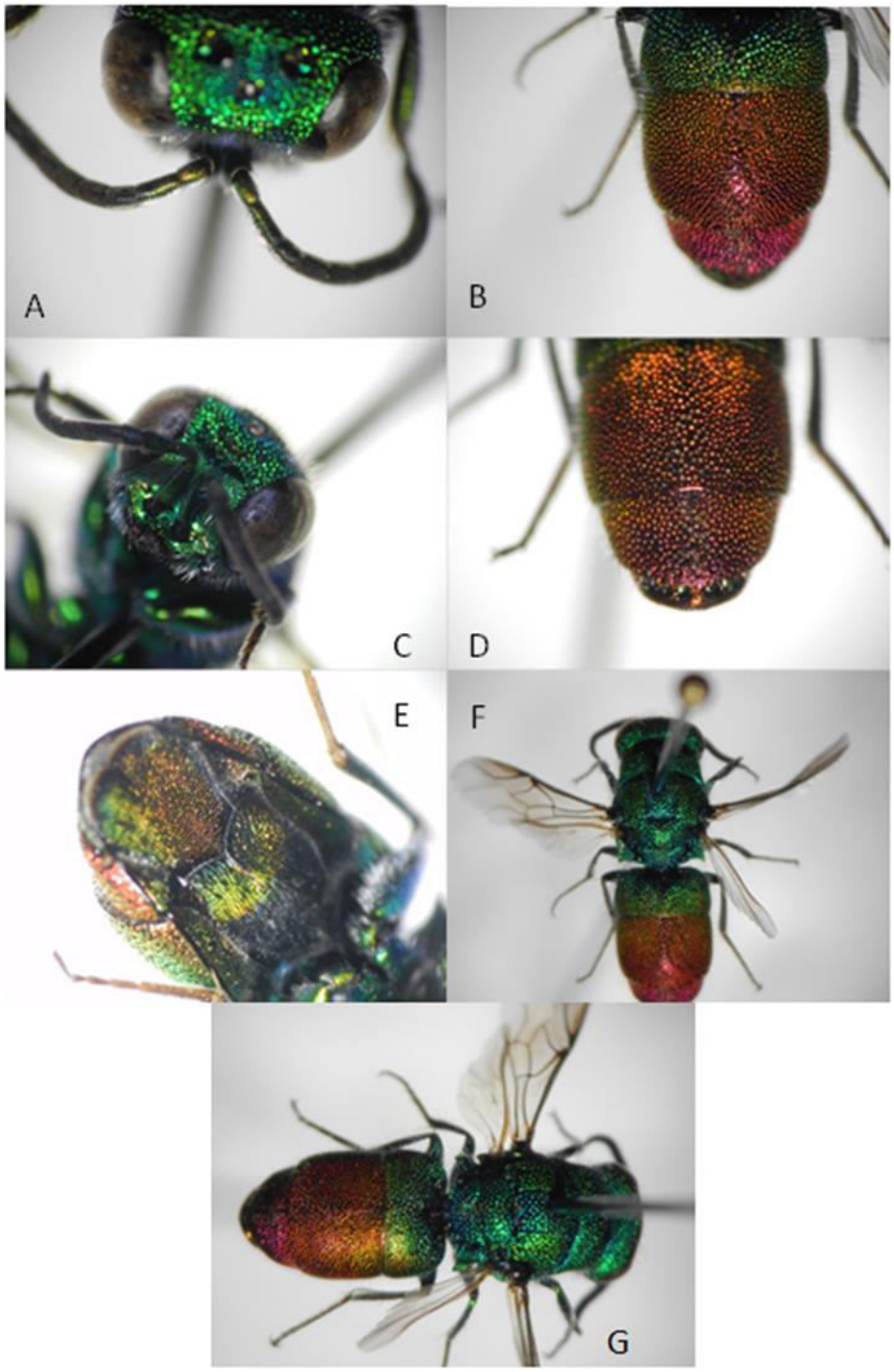


Figure 4.22. *Chrysis coa* Invrea, 1939 (Male): A) Head, antennae, frontal view B) Thorax, dorsal view C) T-III, T-II dorsal view D) Metasoma, dorsal view E) Metasomal sternites, ventral view F) Pronotum, head dorsal view G) Dorsal overview

4.3.3.11. Species: *Chrysis shousboei* Dahlbom, 1854

Material examined: 2♀♀, 3♂♂, Bingöl center, 38°54'24" N 40°30'20" E, 1145 m, 25.VIII. 2016; 3♀, 3♂, 38°54'50" N 40°31'16" E, 1170m, 05.IV.2016; 1♀, 1♂, Genç, 38°44' 57" N 40°31'35" E, 997m, 15.V.2016; 1♀, 1♂, Adaklı, 39°13'15" N 40°28'49" E, 1491 m, 22.V. 2016.

Distribution: Algeria, Morocco and Turkey (Kimsey and Bohart 1991).

Distribution in Turkey: Ordu and Erzurum (Strumia and Yıldırım 2007, 2011).

Remark: This species is a new record for the Chrysididiae fauna of the Bingöl Province.

Diagnosis: Body length 5 mm (Figure 4.23 G); F-I two time longer than F-II or F-III; F-I l/w near 3 (Figure 4.23 F); TFC distinct, malar space about 1.5 MOD, subantennal space nearly 1 MOD (Figure 4.23 A); pit row well developed, apex of T-III without teeth, lateral edge simple (Figure 4.23 B,D); S-II spots distinct, large, and fused (Figure 4.23 E). Colaration: Antennae balck, but pedicel and scape, F-I are metallic (Figure 4.23 F); face metallic green (Figure 4.23 A); vertex head blue with green reflection, gena area blue (Figure 4.23 G); pronotum, mesoscutum, mesoscutellum, tegula are green-golden (Figure 4.23 C); metanotum, propodeum, are blue (Figure 4.23 G); T-I, green, T-II, TIII are red (Figure 4.23B); coxa, femur, tibia are metallic green (Figure 4.23 G); metasomal sternites metallic green (Figure 4.23 E).

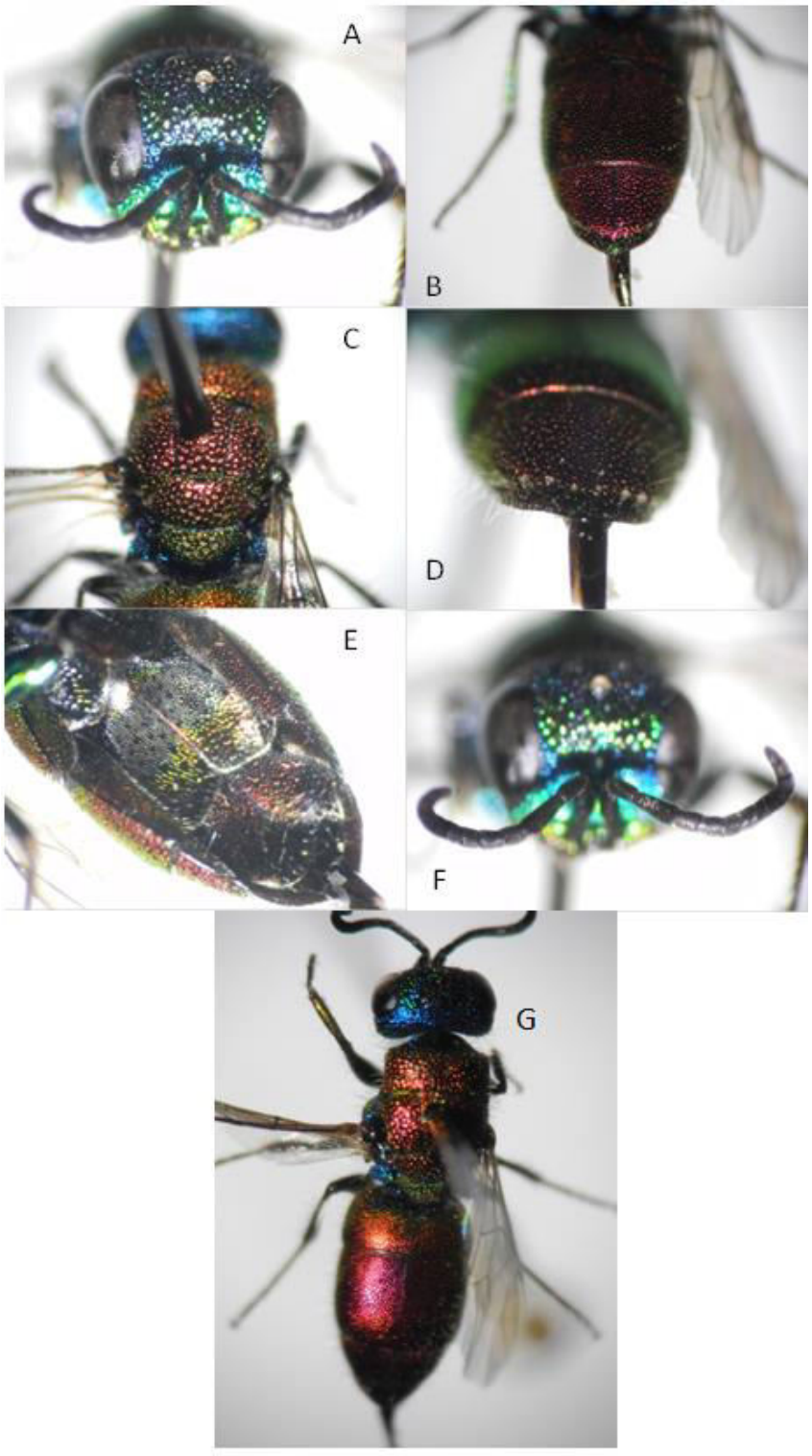


Figure 4.23. *Chrysis shousboei* Dahlbom, 1854 (Female): A) Head, frontal view B) Metasoma, dorsal view C) Thorax dorsal view D) Apex T-III dorsal view E) Metasomal sternites, ventral view F) Head frontal view G) Dorsal overview

Sexual dimorphism: male Chrysididae can commonly be distinguished from females by the terminal portion of the abdomen which is typically broader, flatter, less projecting medially, and with the ventral surface not at all raised in the middle; the apical margin of sternite 3 is more or less pale. If the ♀ ovipositor can not be seen, its existence can be authenticated median line down sternite 3 that is more or less raised behind. In numerous species the males can be recognized by their different color, narrower, scapal basin, shorter gena and shorter antennal segment 3 (Linsenmaier 1994c).

All chrysidids, male or female, have a scape, pedicel, and 11 flagellomeres. The flagellomeres are chiefly cylindrical in cross-section. In a variety of species, however, the male (or less broadly the female) flagellum could be capacious and flattened. Sexual dimorphism in flagellar shape is relatively customary in chrysidids. In amisegines the female flagellomeres are mostly short and wide; in males they are greatlyelongate and setose. The basal male flagellomeres of one species, *Pleurochrysis bruchi,* arebroad and flabellate.

There is also considerable variation in the relative lengths of the first three flagellomeres. In *Holopyga* and *Ceratochrysis* the first flagellomere is usually three or moretimes as long as it is broad. The third flagellomere is usually shorter than the first, atleast in females, but in *Chrysis stilboides,* and other species once placed in the genus *Pyria,* it is the longest flagellomere (with the first much reduced). Another adjustment of these flagellomeres occurs in the males of some species of *Chrysura,* where thesegments are lobulate underneath. (Kimsey and Bohart 1991).

There is a common and great question which is asked a lot how to distinguish males from females in the Chrysididae. In the past this subject has been given rather cursory treatment and so we have decided to discuss this problem at some length distinguishing the sexes is relatively simple in the Cleptinae, Amiseginae, Loboscelidiinae, and Parnopini. In these groups, females have one less external abdominal segment than males. Therefore, in the first three subfamilies males have five-segmented abdomens and females four. In the Parnopini males have four segments and females three. In addition, females often have the ovipostor tube partly exserted.

In the Chrysidini, Elampini, and Allocoeliini determining the sex of the specimen is much more difficult without extracting the genitalia. Some genera are sexually dimorphic to some extent. Male *Allocoelia* have much longer tongues than females. In *Neochrysis, Pleurochrysis, Ipsiura,* and *Exochrysis* male S-IV is clearly visible, protruding beyond S-III for at least one-quarter of the length of S-III. S-IV is not visible in females. In *Hedychrum* the female S-III has a sub-basal transverse carinae and usually has an apicomedial tooth or small projection of some sort. Female *Elampus* have a row of short, erect, closely placed setae along the genal region behindthe eye *Exallopyga* males have a stripe of dense appressed setae extending down the mid-line of T-III; and T-III is slightly notched apicomedially.

Otherwise, the shape in these three subfamilies of S-III differs between the sexes. In males S-III is totally flat, and the membranous apex of S-IV is habitually visible. S-III in females generally has a triangular swelling, apicomedially. Females may also be recognized if the ovipositor is exserted. However, if only the tip of the ovipositor is showing, this structure can be confused with the partly exserted male genitalia and vice versa. By close examination it is possible to see the slender, needle-like first valvulae between the second and third valvulae in females. Although the apices of the gonocoxae can resemble those of the third valvulae, and the apex of the aedeagus resembles that of the second valvulae, there is never a slender needle-like medial structure showing in males (Kimsey and Bohart 1991).

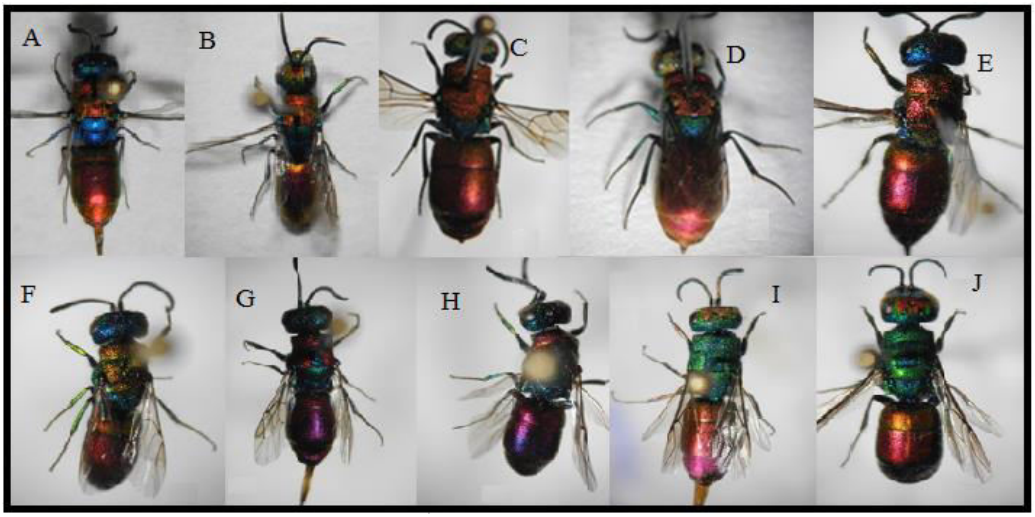


Figure 4.24. *Chrysura ciscirtana* A) Female. B) Male. *Chrysura pseudodichroa*; C) Male D) Female *Chrysis schousboei*; E) Female F) Male *Chrysis rubricate*; G) Female H) Male *Chrysura ignifrons*; I) Female J) Male

Figure 4.25. Genitalia capsule of Male *Chrysura ignifrons* (Brulle, 1833)

Table 4.5. Name of species and their existence in Bingöl

Number	Region / Name of species	Merkez	Adaklı	Ilıcalar	Karlıova	Kiğı	Genc	Solhan	Yuzenada	Yayladere	Yedisu
1-	*Cleptes dahlbomi* Semenov 1920	_	_	_	_	_	+	+	_	_	_
2-	*Holopyga ignicollis* Dahlbom 1854	_	_	_	_	_	+	_	_	_	_
3-	*Chrysidea Pumila* (Klug, 1845)	+	_	+	_	_	_	_	_	_	_
4-	*Chrysis ambigua* Radoszkowski,1891	_	_	+	_	_	_	+	_	_	_
5-	*C.bilobata* Balthasar, 1953	_	_	_	_	_	+	_	_	_	_
6-	*C.cerastes* Abeille, 1877	_	_	_	_	_	+	_	_	_	_
7-	*C.ciliciensis* Mocsary, 1893	+	_	_	_	_	_	_	_	_	_
8-	*C. coa* Invrea, 1939	_	_	_	_	+	+	_	_	_	_
9-	*C. concolor* Mocsary, 1893	_	_	_	_	_	+	_	_	_	_
10-	*C. inaequalis* Dahlbom 1845	+	_	_	_	_	_	_	_	_	_
11-	*C. mirabilis* Radoszkowskil, 1876	+	_	_	_	_	+	_	_	_	_
12-	*C. ragusae* De-Stefani, 1888	_	_	_	_	_	_	+	_	_	_
13-	*C. rubricate* Mocsary, 1902	+	_	_	_	_	+	+	_	_	_
14-	*C. schousboei* Dahlbom, 1854	_	+	_	_	_	+	_	_	_	_
15-	*Chrysura anatolicata* Trautman, 1926	+	_	_	_	_	+	+	_	_	_
16-	*Chr.bacha* (Batlhasar, 1953)	+	_	_	+	+	_	_	_	_	_
17-	*Chr. ciscirtara* (Linsenmaier, 1959	+	+	+	+	+	+	+	+	_	+
18-	*Chr.dichroa* (Dahlbom, 1854)	_	_	_	_	_	+	_	_	_	_
19-	*Chr.ignifrons* (Brulle, 1833)	+	+	+	_	+	+	+	+	_	+
20-	*Chr. laevigata* (Abeillede Perrin, 1879)	_	_	_	_	_	+	_	_	_	_
21-	*Chr. trimaculata* (Froster, 1853)	+	_	_	_	_	_	_	_	_	_
22-	*Chr. pseudodichroa* (Linsenmaier, 1959)	+	_	+	_	_	+	+	+	_	_
23-	*Chr. simplex* (Dahlbom, 1854)	+	_	_	_	_	+	_	_	_	_

5. DISCUSSION

In Turkey from different parts of Bingol Province there are collections of 23 Chrysidid species. They are presented in 5 genera. They are 22 new species for Bingol. The material examined, distribution and diagnosis of the species are presented.The genera are ordered according to Kimsey & Bohart (1991), in which genus and species are listed alphabetically. Most of the specimens are determined by helping Paolo Rosa (Italy).

Cucko Wasp in Turkey is greater. Turkey commonly is known Palearctic region rich in species of chrysididae (Kimsey and Bohart 1991). The results of the study like following first 47.82% of the species belonging to sub family Chrysidiniae genus *Chrysis* (Linnaeus, 1761), second 39.13% of species belonging to sub family Chrysidinae genus Chrysura (Dahlbom, 1854), third 4.34% of species belonging to sub family Chrysidinae genus *Chrysidea* (Klug, 1926), forth 4.34% of species belonging to subfamily Elampinae genus *Holopyga* (Dahlbom, 1845), and the last 4.34% of species belonging to sub family Cleptinae genus *Cleptes* (Latreille, 1802).

Total proportion of Chrysidinae is a high rate in this study and this is a worthy and positive ratio for us because this subfamily which is related to the family of Chrysididae is a lot in the world and also in Turkey especially in Bingol province. While the percentage of *Cleptes* is low in this project. Again this result is a positive one according to our research. Because the rate of this species is already low in the world and in Turkey, too. But the rate of Elempinae in the world and in Turkey is a high rate (Kimsey and Bohart 1991). But because of many different reseanes is so low in this study and it is not a good, proper and favorable result for us. The collector could not collect a lot more. May be strong ways were not used for collecting by researcher. May be there are not a lot more species exists there. May be the researcher could not be able to

recognize them. Also we have a lot more that we could not determine them because the researcher could not recognize them.

The total final proportion of the species of Genus of *Chrysis* Linnaeus, 1761 is a high amount in this study which is 11 species, this genus consists 80 % of species of Chrysidinae. The final result is a great constructive rate because the percentage of species of it is a lot in the world and also in Turkey. However the final total ratio of the species of *Chrysura* Genus which is the seconed greates genus of the subfamily Chrysidinae is a high affirmative one in this research which is 9 species also it is a lot in the world and in Turkey. Meanwhile the final total rate of species of *Cleptes* is a low ratio in this study and this is a progressive and normal rate because this genus has so few species in Turkey and in the world (Kimsey and Bohart 1991). And all species according to this research are colorful. Hence Turkey located in palaearctic region, here we can see similaritiy between results other authors in palaeartic region and this result both in colors and other feathures, hopfully this is huge brilliant for the result of this work and the results of this study increase the recorded taxa for Turkey from 443 species Strumia and Yıldrım (2011) to 446 species.

6. CONCLUSION

In the year 2016 the Biology Department of Bingöl University in captured about 350 specimens belong to three subfamily,five genera and 23 species of Chrysididae all in Bingöl region, Eastern Turkey 22 species result new for Bingöl region namely and three species new Turkish Chrysididae fauna *Chrysis bilobata* Balthasar, 1953 *Chrysis coa* Invrea, 1939 and *Chrysis rubricata* Mocsary, 1902. For subfamily Cleptinae in one genus (*Cleptes* Latreille, 1802), one species (*Cleptes dahlbomi* Semenov, 1920), subfamily Elampinae in one genus (*Holopyga*, Dahlbom, 1845), one species (*Holopyga ignicollis*, Dahlbom, 1854); and from subfamily Chrysidinae 21 species in three genera of these first *Chrysura* (Dahlbom, 1845) nine species, *Chrysura anatolicata* Trautman, 1926, *Chrysura simplex* (Dahlbom 1854), *Chrysura trimaculata* (Förster, 1853), *Chrysura ignifrons* (Brulle 1833), *Chrysura dichroa* (Dahlbom, 1845), *Chrysura ciscirtana* Linsenmaier,1959, *Chrysura pseudodichroa* (Linsenmaier, 1959), *Chrysura baccha* (Balthasar, 1953), *Chrysura laevigata* (Abeille, 1897); and in the second genus *Chrysidea* (Bischoff, 1910) one species, *Chrysidea pumila* (Bischoff, 1910) and in the third genus *Chrysis* Linnaeus, 1761 eleven species, *Chrysis cerastes* Abelle, 1877, *Chrysis ambigua* Radoszkowski, 1891, *Chrysis inaequalis* Dahlbom, 1845, *Chrysis concolor* Mocsary, 1893, *Chrysis ragusae* De-stefani, 1888, *Chrysis mirabilis* Radoszkwski, 1876, *Chrysis ciliciensis* Mocsary, 1914, *Chrysis shousboei* Dahlbom, 1854, These results confirm the richness of the Turkish Chrysididae fauna. Distribution, diognisis and remarks are explained.

7. RECOMMENDATION

1- The collector should use assorted ways for collecting species.
2- Visiting more localities for collecting.
3- The researcher shoud be supported by obtaining material help. For instance: they give the collectors suitable cars that could go to high places, such as: high hills and mountains.
4- Before visiting hills, planet and mountains the collector should see guid- species in Laboratory inorder to recognize them.
5- An expert supervisor in the field and aspect is being chosen by researcher more helpful in finishing the project more easily and urgently.
6- The collector had better start collecting species at the end of March and in the beginning of April.
7- In most of the places in the country there is not internet access, so had better not focus on using mobile for modifying geographical region. Using special equipment in this aspect more helpful.
8- The collector needs to look every place for collecting species (grasses, plants, flowers, rocks, etc…) because most of the species are on the rocks in order to put their eggs on larvae. They look for their hosts on the rocks.
9- Depending in pictures for identifying species by the collector is a useful thing.
10- It is a good idea that researcher after catching species immediately separate them from net. Directly separate body parts because if the collector does not does that then should put in hot water and it will cause to dust off or to fall heir body parts

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