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The zoogeographical composition and distribution of the Anatolian Pimeliini (Coleoptera, Tenebrionidae) [1]

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SUMMARY

Fifteen species of Tenebrionidae Pimeliini from the Anatolian peninsula and Cyprus are reported. Much of the information concerns occurrence records based on literature data and material collected, for the most part, in recent years. Some information is also presented that includes aspects of habitat preference, taxonomic problems and general distribution. According to their distribution ranges, the Anatolian Pimeliini can be grouped into the following general chorological categories: Turanian, North East African-Sindian, Mediterranean, East Mediterranean, and South West Asiatic species. Seven species are endemic. As to their distribution within the study area, the Anatolian Pimeliini can be grouped as follows: species widely distributed in Western and Central Anatolia, species restricted to Central or South Central areas, and species restricted to Eastern Anatolia. Three Anatolian endemic species are known from Central Anatolia and four from eastern areas. The Turanian influence seems to be greatest in Eastern Anatolia, where high altitude mountains predominate, while the Mediterranean influence seems to be strong in Southern and Western Anatolian coastal chains. The central plateau shows a transitional character, due to the overlap of Turanian and Mediterranean elements; however, the Mediterranean elements in the central plateau could be actually of Irano-Turanian origin. Species linked to Mediterranean climate and vegetation types are presently restricted to the coastal areas, while species adapted to drier, but not necessarily hot environments are especially distributed in the inner part of the peninsula. A general congruency between Pimeliini distribution patterns and biogeographical provinces may be related to current ecological conditions, Pleistocene climatic changes and post-Pleistocene aridification processes.

INTRODUCTION

The aim of this paper is to summarize the current state of knowledge of the Tenebrionidae Pimeliini of the Anatolian peninsula and to place this limited but biogeographically composite fauna in perspective.

Turkish Pimeliini are very poorly known. The state of the art of their systematics is essentially represented by the general keys to Palaearctic Pimeliini provided by Reitter (1915), who summarized all systematic data available at his

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time and also described a number of taxa, many of which from Turkey. After Reitter, a new Turkish taxon (*Pimelia lendli*) was described by Kaszab (1938). More recently, for the subgenus *Camphonota* of the genus *Pimelia*, a systematic review (including faunistic data) was proposed by Kwieton (1982). In this paper, two new taxa (*Pimelia monikovae* and *P. akbesiana* ssp. *evanescens*) were described from Turkey, and many synonymies were proposed. However, the systematic arrangement depicted by Kwieton mainly follows that of Reitter (1915).

As to the faunistic information, some data on Turkish Pimeliini were reported by Kaszab (1938, 1939, 1960, 1961, 1968). After Kaszab, no relevant papers have been published. A comprehensive paper on the biogeography of Turkish Tenebrionidae at the genus level published by Kwieton (1986) is clearly based on literature data.

This is a decided gap in the knowledge of the distribution of Palaearctic tenebrionids, especially as Asia Minor forms an important transition zone at the junction of Europe and Asia.

In recent years, many entomologists collected Tenebrionidae in Turkey and the present paper has benefited from the fact that the authors have obtained a great number of specimens collected throughout the whole Anatolian peninsula during expeditions performed by the Universities of Rome from 1974 to 1999. Inspection of some other public and private collections gave additional data.

On the basis of literature and new records, we have been able to assess the distribution of all Pimeliini recorded from Anatolia. More importantly, we have been able to place the fauna in zoogeographical perspective and to interpret it in relation to neighboring areas. There are still gaps in our knowledge of the Anatolian Pimeliini; especially the eastern areas are worthy of more attention than they have received thus far. However the data in this paper are sufficient to outline the general picture and further research is unlikely to alter the main conclusions.

MATERIAL AND METHODS

This work covers the Anatolian peninsula and Cyprus.

We have attempted to list all localities in which specimens were captured, the date, the name of the captor(s), and the number of specimens examined. Also, we have decided to list as fully as possible all literature localities from where the individual tenebrionids are known. However, records have been accepted from the literature with considerable caution. What we have included depends very largely on the difficulty of identification and on the expertise of the taxonomists. For example, data concerning specimens of doubtful identification (*e.g.*, Franz, 1989) have been omitted and preference has been given to recent works.

The transcription of Turkish names always poses difficulties, and few maps agree in this respect. Indeed, classical names, modern Greek, Russian, and old and modern Turkish names have all been used and spelling is often diverse. The names accepted in this paper are mainly based on the spelling used on road signs and on current

road maps. In general, we have modernized the old spelling used in literature if the name is an orthographic variant (frequently due to erroneous transcriptions). When the modern or the exact name is manifestly different from that reported in literature or on the label of specimens examined, it is given in brackets. In using modern Turkish spelling, however, we have not used diacritical signs for "g" and "s".

Unfortunately, the fact that many different places have the same name makes their location a difficult (and generally insoluble) problem. A few localities could not be located with full accuracy despite careful researches. However, the loss of information was slight.

To ordinate localities, we have used the modern provinces (vilayets). Localities are listed alphabetically for each vilayet.

The following list gives the present location of the material examined:

CF = S. Fattorini collection, Rome;
CL = P. Leo collection, Cagliari;
CMA = M. Malmusi collection, Modena;
CME = C. Meloni collection, Cagliari;
CMI = E. Migliaccio collection, Rome;
CO = G. Osella collection, Università di L'Aquila, L'Aquila;
CS = C. Sola collection, Modena;
MZUR = Museo di Zoologia, Università di Roma "La Sapienza", Rome.
HNHM = Hungarian Natural History Museum, Budapest.

The sequence of genera and subgenera follows the order adopted by modern taxonomists. Within genera and subgenera, species are ordered alphabetically.

Although for various accepted species taxonomic notes are reported, no attempt has been made to include a full systematic revision. For the subgenus *Camphonota* synonyms cited by Kwieton (1982) have been provisionally accepted, but various taxa recognized by this author were regarded as doubtful. The subgenus *Camphonota* includes a number of species and subspecies difficult to identify because most of the taxa have been very imperfectly described and poorly (or not at all) illustrated. In fact, on the basis of the examination of abundant material from Turkey, we found that many characters, including those used by Kwieton (and earlier students) to separate species and subspecies, are of scarce taxonomic value due to their high state variability. A study of various Greek populations belonging to some *Camphonota* taxa gave similar results. Therefore, appreciable changes may be expected when the difficult taxonomy of this group is clarified. In view of this, we are of the opinion of studying more abundant material from other countries (especially Greece) and compare this with material from Turkey before making any conclusions.

As far as the Turkish populations are concerned, we think that many *Camphonota* taxa, recognized as species or subspecies, may have to be reduced in rank (or included in synonymy) when they become better known.

These doubtful taxa are discussed in depth, but at present no taxonomic changes were made.

Chorotypes follow Vigna Taglianti et al. (1999).

All accepted species have been mapped. Dot maps have been used, each symbol representing a locality (or a group of localities) from which a specimen has been examined or cited.

1. Sternoplax (Pachysternoplax) nicomedia (Reitter, 1908)

LITERATURE DATA

vil. Amasya: Amasya (Reitter, 1908).

TAXONOMIC REMARKS

S. nicomedia is known by only the holotype from Amasya. This species was placed by Reitter (1908) in the genus *Trigonoscelis*. Skopin (1973) removed this species from the genus *Trigonoscelis* and placed it in the genus *Sternoplax*. Also, Skopin grouped this species with *Sternoplax armeniaca* (Faldermann, 1836) (likewise placed in the genus *Trigonoscelis* by Reitter, 1908) into the subgenus *Pachysternoplax* Skopin, 1973.

RANGE

Endemic to the Anatolian peninsula (Gebien, 1937). Turanian chorotype.

2. Trachyderma (Atrachyderma) setosa (Fischer, 1832)

MATERIAL EXAMINED

vil. Agri: Mt. Ararat, 15.X.1994, 1 (CL). vil. Van: Van, 20.VI.1971, P. Machard leg., 6 (CL).

LITERATURE DATA

vil. Van: Van env., 1750 m, 28.V.1966, 1 (Kaszab, 1968 sub *Ocnera setosa* Mén. [sic!]).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Bitlis: Ahlat, NE coast Vanöglü, 19.V.1966, 1 (Kaszab, 1968 sub *Ocnera setosa* Mén. [sic!]).

RANGE

Transcaucasus, Eastern Turkey, Iran, Caspian Sea, Afghanistan (Gebien, 1937; Gridelli, 1954). Turanian chorotype.

? Trachyderma (Trachyderma) hispida (Forskål, 1775)

MATERIAL EXAMINED

vil. Nevsehir: Urgup, 1.VIII.1969, P. Machard leg., 2 (CL).

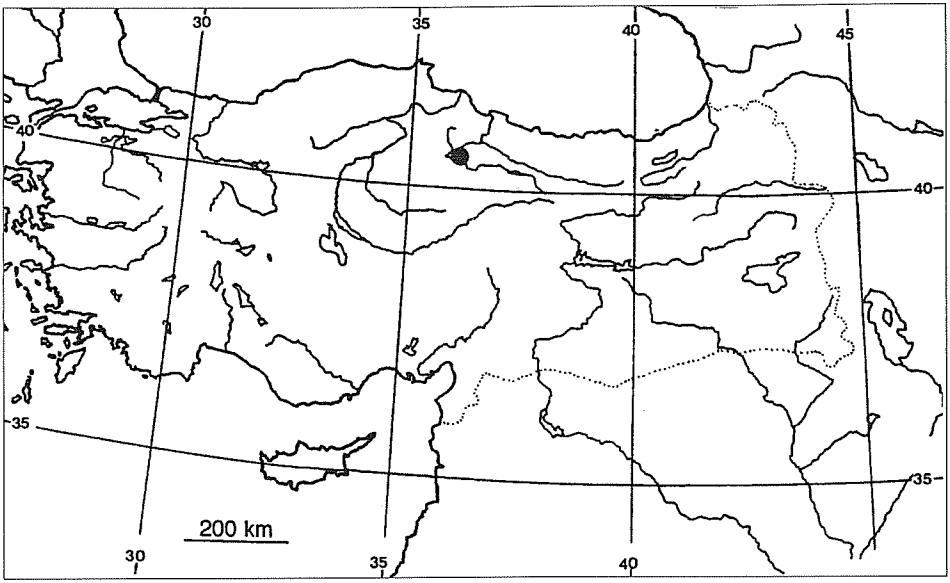

Fig. 1 - Distribution of *Sternoplax nicomedia* (Reitter).

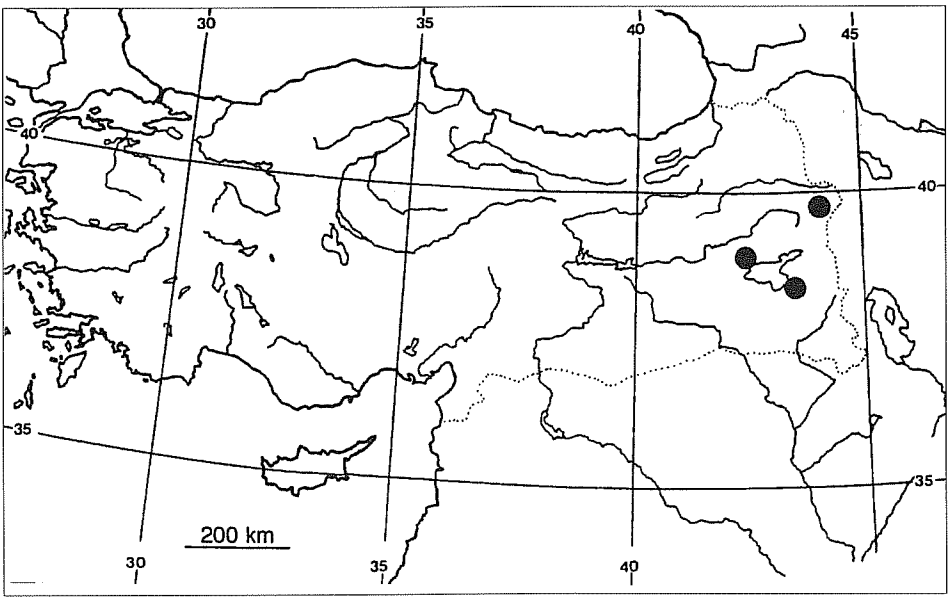

Fig. 2 - Distribution of *Trachyderma setosa* (Fisher) in Anatolia.

LITERATURE DATA

vil. Ankara: Ankara, 16.IX.1936; idem, V.1937 (Kaszab, 1939). vil. Mardin: Mardin, 1937 (Kaszab, 1939).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Malatya: Malatya, Sultansuju Hara, VI.1937 (Kaszab, 1939).

RANGE

North Africa, Egypt, Somalia, Ethiopia, Sudan, Arabia, Palestine; perhaps Syria and Southern Iran (Gridelli, 1954). The native occurrence of this clearly eremic and sometimes anthropophilic species in Anatolia is questionable. Saharo-Sahelo-Sindian chorotype.

3. Trachyderma (Trachyderma) lima (Petagna, 1819)

MATERIAL EXAMINED

vil. Nevsehir: Urgup, 1.VIII.1969, P. Machard leg., 1 (CL); vil. Mersin: Erdemli, 17.IV.1997, P. Machard leg., 2 (CL).

LITERATURE DATA

CYPRUS: Ayos Vassilios, VI.1974, G. Alziar leg. (Grimm, 1991).

This species was quoted from Anatolia by various authors (*e.g.*, Gebien, 1937; Grimm, 1991) without any locality being specified.

RANGE

Palestine, Lebanon, Syria, Cyprus, Anatolia, Greece, Greek Islands (Santorin, Syros, Milos, Crete and Rhodes), Sicily, Libya, Tunisia, Algeria (Gridelli, 1954, Kühnelt, 1965; Grimm, 1981; Kwieton, 1986). The species, dubiously cited from Sardinia (Gardini, 1995), should be removed from the fauna of this island. We do not know specimens of *T. lima* from Sardinia and it was never found on this island during about 30 years of researches by one of us (PL). Even if widely distributed, *T. lima* is an extremely rare species throughout its range. Therefore, until a greater series of this species is collected, its actual distribution in Anatolia is uncertain. Mediterranean chorotype.

4. Trachyderma (Trachyderma) philistina Reiche and Saulcy, 1857

MATERIAL EXAMINED

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Konya: S Seydisehir, Gigendelmez Daglari, 1650 m, 16.VII.1992, Mazzi leg., 3 (CL).

CYPRUS: Caboz Akrotiri, VI. 1991, 2 (CL); Kokkinohoria, 19.IV.1995, E. Colonnelli leg., 1 (CL); Larnaca, salt lake, 5-10.IV.1996, R. Lisa leg., 1 (CL).; Nicosia, Nicosia city, 24.X.1996, M. Zapparoli leg., 2 (MZUR); Paphos env.,VI.1991, 2 (CL).

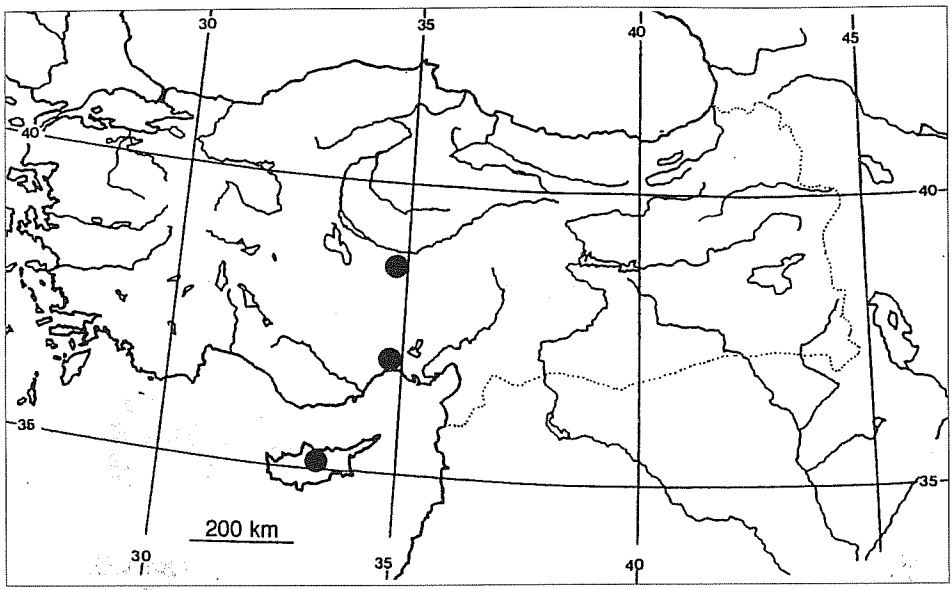

Fig. 3 - Distribution of *Trachyderma lima* (Petagna) in Anatolia.

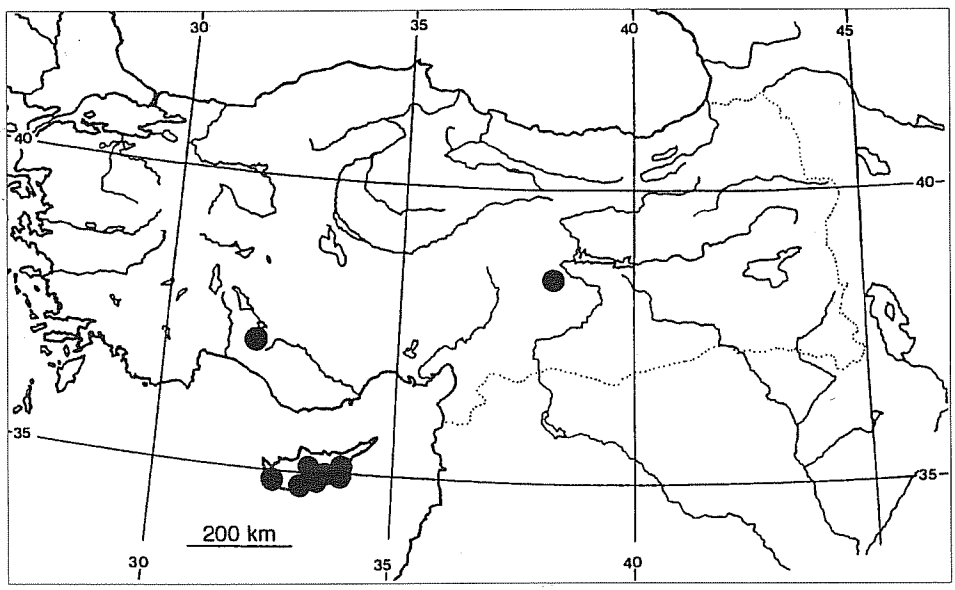

Fig. 4 - Distribution of *Trachyderma philistina* Reiche and Saulcy in Anatolia.

LITERATURE DATA

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Malatya: Malatya, Sultansuju Hara, VI.1937, 7 (Kaszab, 1939 sub *Ocnera philistrana* Rche).

CYPRUS: Akaki, V.1978, G. Alziar leg.; Aya Napa, VI.1984; idem, XII.1988, R. Grimm and A. Rachinsky leg.; Famagusta; Larnaca, 1896; NNE Larnaca, XII.1988, R. Grimm and A. Rachinsky leg.; Laxia, XII.1988, R. Grimm and A. Rachinsky leg.; Limassol, IV-V.1977; Paphos, XII.1988, R. Grimm and A. Rachinsky leg.; Skarinou, III.1984, G. Alziar and P. Ewald leg. (Grimm, 1991; and references therein).

RANGE

Rhodes, Anatolia, Cyprus, Arabia, Syria, Egypt, Jordan, Iran, Iraq, Palestine, Pakistan (Koch, 1935a; Kaszab, 1982; Kwieton, 1986; Grimm, 1991). Reports from Greece (cf. Kwieton, 1986) are probably wrong (cf. Kühnelt, 1965). North East African-Sindian chorotype.

5. Pachyscelis (Pachyscelis) musiva ssp. musiva (Ménétriés, 1832)

MATERIAL EXAMINED

vil. Bitlis: Resadiye (Satvan pass), 2300 m, 1.VII.1971, A. Vigna leg., 2 (sub *P. musiva divisa* Reitt., Kaszab det., 1975) (MZUR). vil. Van: Van, Guzeldere geç., 2200 m, 5.VI.1998, G. Sama leg., 5 (CL).

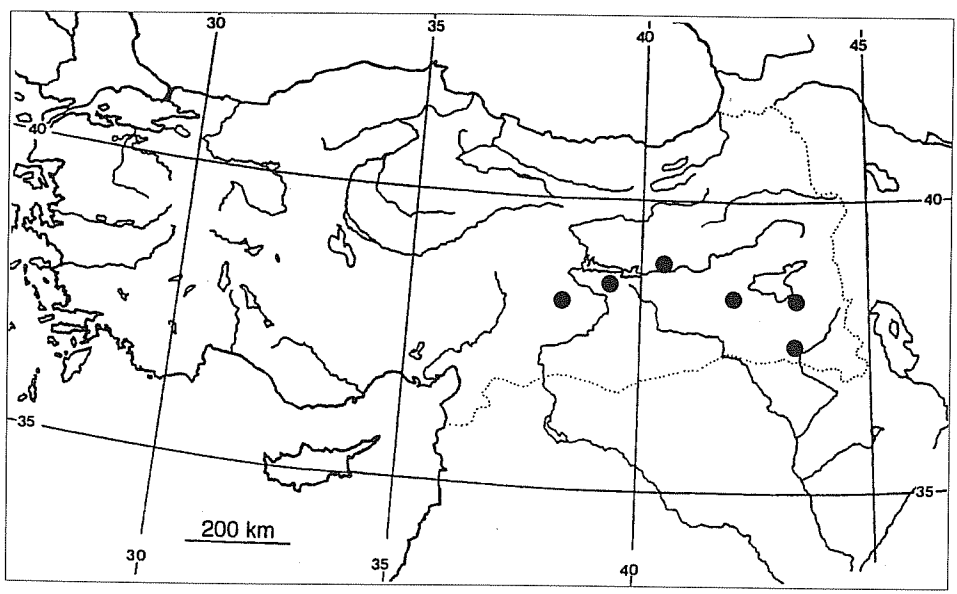

Fig. 5 - Distribution of *Pachyscelis musiva musiva* (Ménétriés) in Anatolia.

LITERATURE DATA

vil. Elazig: between Elazig and Ergani, 14.V.1966, 1 (Kaszab, 1968 sub *P. musiva gastridula* Fald.). vil. Van: Gürpinar, 20.V.1966, 4 (Kaszab, 1968 sub *P. musiva gastridula* Fald.); Kusunkiran, E Van, 2265 m, 29.V.1966, 1 (Kaszab, 1968 sub *P. musiva gastridula* Fald.).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Bingöl: Bingöl-Kuruca, 16.VI.1966, 2 (Kaszab, 1968 sub *P. musiva mamillata* Fald.). vil. Bursa: between Yüksekova and Semdinli (Hakkari), 24.V.1966, 4 (Kaszab, 1968 sub *P. musiva gastridula* Fald.). vil. Malatya: Malatya, Sultansuju Hara, VI. 1937, 1 (Kaszab, 1939 sub *P. musiva divisa* Reitt.).

TAXONOMIC REMARKS

A number of subspecific taxa were described, but their actual taxonomic status is uncertain. According to Kwieton (1980), the South West Iranian populations should be referred to ssp. *achaemenia* Bogacev, 1949, while all the other populations (including the Anatolian ones) have to refer to the typical form.

RANGE

Eastern Anatolia, Caucasus, Armenia, Azerbaijan, Iran, Kurdistan, Mesopotamia (Kwieton, 1980). South West Asiatic chorotype.

6. Pahyscelis (Parapachyscelis) villosa (Drapiez, 1820)

MATERIAL EXAMINED

vil. Afyon: Acigöl lake, northern coast, Dazkiri env., 900 m, 5.V.1991, M. Bologna leg., 4 (1 CL, 3 MZUR); Sultan Dag, 1200 m, 10-20.VI.1993, M. Malmusi leg., 2 (1 CL; 1 CMA). vil. Ankara: Tuzgölü, 30 km S Sereflikoçhisar, 900-1100 m, 3.V.1992, M. Bologna and C. Marangoni leg., 1 (MZUR). vil. Antalya: 50 km NNW Antalya, 9.V.1985, 1 (CL); Korkuteli, 5.VII.1986, L. Falletti leg., 1 (CL). vil. Aydin: 15 km SW Soke Priene, 24.V.1984, G. Drioli leg., 8 (CL); idem, 1.V.1967, 1 (CL). vil. Bursa: Iznik, 200 m, 26.VII.1991, Mazzi leg., 2 (CL). vil. Çanakkale: Kirazli, 600 m, 13.VI.1991, M. Malmusi leg., 2 (CMA); Truva (= Troja), 16.V.1977, Calligaris leg., 7 (CL). vil. Denizli: Aphrodisias, 10.V.1985, M. Gabriele leg., 6 (CL); Pamukkale env., 5.VII.1987, M. Malmusi leg., 3 (CMA); idem, 25.VI.1990, W. Pagliacci leg., 1 (CL). vil. Eskisehir: 27 km W Sivrihisar, 1100 m, 2.V.1987, A. Vigna leg., 1 (MZUR). vil. Izmir: Efes (= Ephesos), VII.1973, M. and G. Osella leg., 2 (MZUR); idem, 10.V.1985, M. Gabriele leg., 8 (7 CL, 1 CMI); Kusadasi, V.1993, 4 (CME); idem, 5.VII.1987, M. Malmusi leg., 4 (CMA); Urla, 10.VIII.1970, Boggio leg., 1 (CL); Yenicöy, 60 m, 3.V.1991, Bologna leg., 5 (MZUR); idem, 3.V.1991, M. Zapparoli leg., 2 (MZUR). vil. Kayseri: 1 km W Incesu, 1150 m, 26.V.1988, M. Zapparoli leg., 1 (MZUR); between Urgup and Develi, 16.V.1989, P. Robert

leg., 6 (1 CL; 5 CME). vil. Konya: Beysehir, 1100 m, 22.VII.1991, Mazzi leg., 2 (CL). vil. Manisa: Akhisar, 28. V. 1974, E. Migliaccio leg., 1 (CMI). vil. Mugla: Fethiye env., 150 m, 27.IV-1.V.1982, M. Bologna leg., 2 (MZUR); idem, 27.IV-1.V.1982, C. Manicastri leg., 2 (MZUR).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Eskisehir: Çukurbisar, 1000 m, 12.VII.1972, M. and G. Osella leg., 1 (MZUR). Tiruva (= Truva?), 29.VI.1973, M. and G. Osella leg., 1 (MZUR).

LITERATURE DATA

vil. Ankara: Ankara, V.1937, 4 (Kaszab, 1939); Dodurga near Fethiye, Petrovitz-Ressl leg., 4 (Kaszab, 1968). vil. Antalya: Antalya, Petrovitz-Ressl leg., 2; Aspendos near Antalya, Petrovitz-Ressl, 1; Demre near Finike, Petrovitz-Ressl leg., 2 (Kaszab, 1968). vil. Eskisehir: Karacasehir, 1906, Lendl leg. (Kaszab, 1938). vil. Konya: Ivriz, 1906, Lendl leg.; Konia, 1906, Lendl leg. (Kaszab, 1938). vil. Nigde: Çiftehan, 1906, Lendl leg. (Kaszab, 1938).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Ankara: Ankara, Baraj, 3-4.VII.1947 (Kaszab 1959). Elmali (there are at least 14 localities named "Elmali" in 12 different vilayets), Petrovitz-Ressl leg., 2 (Kaszab, 1968). Köycegiz (there are at least 2 localities named "Köycegiz" in 2 different vilayets), Petrovitz-Ressl leg., 9 (Kaszab, 1968). Kurudere, Emir Daglari (there are at least 3 localities named "Kurudere" in 3 different vilayets), 6.IX.1947 (Kaszab 1959). Mogan

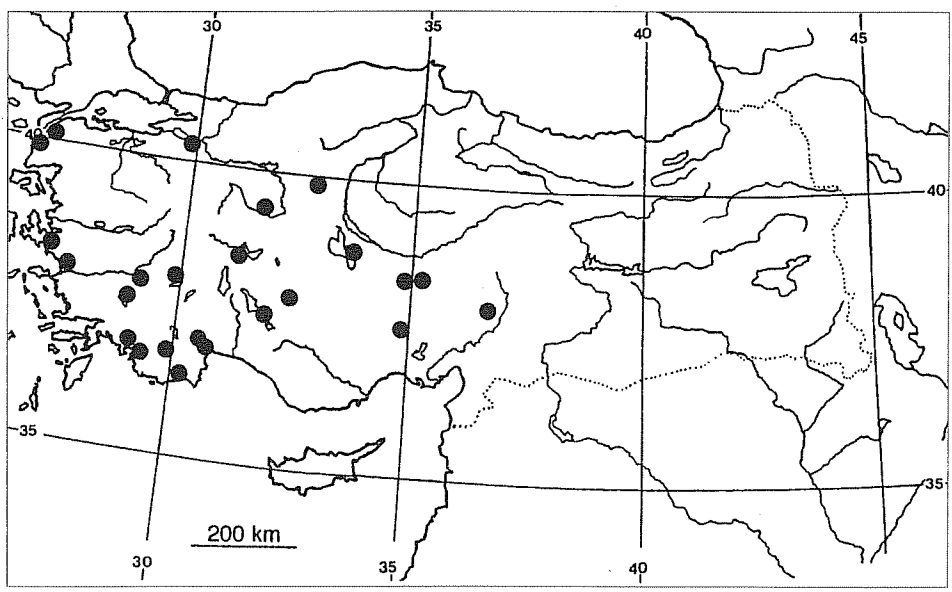

Fig. 6 - Distribution of *Pachyscelis villosa* (Drapiez) in Anatolia.

gölü, 12.VII.1947 (Kaszab 1959). Suleyman H. Yayla, 17.VII.1911, Náday leg. (Kaszab, 1938). Tshajan, 1906, Lendl leg. (Kaszab, 1938).

RANGE

Northern Syria, North West Mesopotamia, Anatolia, Aegean Islands (Kea, Kythnos, Milos, Tinos, Syros, Paros, Psarra, Naxos, Samothraki, Chios, Lemnos, Lesvos, Samos, Fourni, Kalymnos, Kos, Karpathos, Rhodes) (Kühnelt, 1965; Kwieton, 1980, 1986); records from Peloponnese and Crete are doubtful (cf. Kühnelt, 1965). East Mediterranean chorotype.

7. **Graecopachys quadricollis** (Brullé, 1832)

MATERIAL EXAMINED

vil. Aydin: 15 km SW Soke Priene, 24.V.1984, G. Drioli leg., 1 (CL). vil. Denizli: Aphrodisias, 10.V.1985, M. Gabriele leg., 4 (CL); Pamukkale, 25.VI.1990, W. Pagliacci leg., 2 (CL). vil. Izmir: Efes (= Ephesos), VII.1973, M. and G. Osella leg. (sub *Pachyscelis smyrnensis*, Kaszab det.), 3 (MZUR); Kusadasi, 5.VII.1987, M. Malmusi leg., 1 (CMA). vil. Kayseri: 1 km W Incesu, 1150 m, 26.V.1988, M. Zapparoli leg., 4 (2 CL, 2 MZUR). vil. Konya: Ivriz, 1250 m, 8.VII.1991, Mazzi leg., 1 (CL); Konia env. (North), 28.V.1981, G. Sama leg., 1 (MZUR). vil. Mugla: Marmaris, 26.VIII.1989, M. Malmusi leg., 2 (1 CL; 1 CMA).

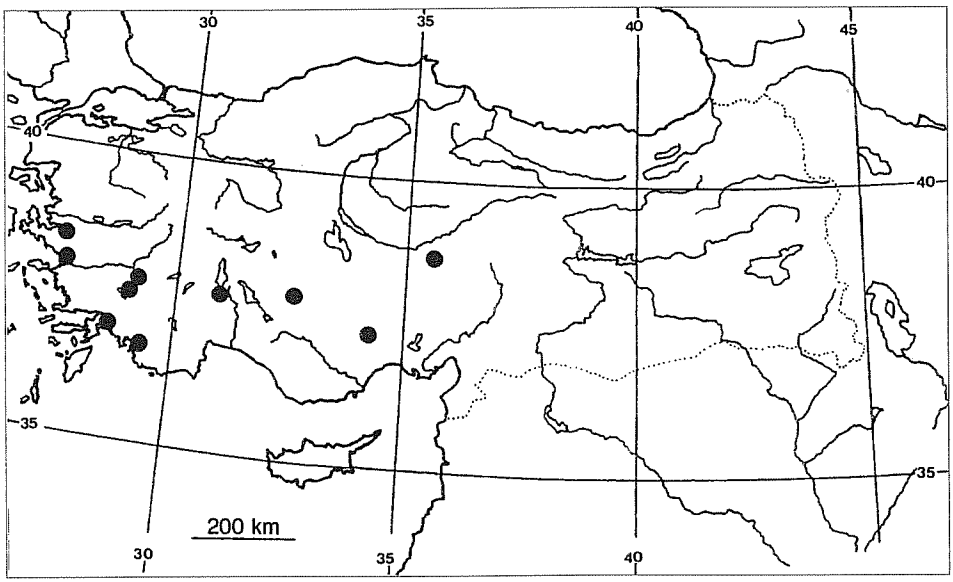

Fig. 7 - Distribution of *Graecopachys quadricollis* (Brullé) in Anatolia.

LITERATURE DATA

vil. Ankara: Dodurga near Fethiye, Petrovitz-Ressl, leg., 1 (Kaszab, 1968 sub *Pachyscelis quadricollis smyrnensis* Kr.). vil. Isparta: Egridir, Petrovitz-Ressl leg., 1 (Kaszab, 1968 sub *Pachyscelis quadricollis smyrnensis* Kr.). vil. Kirsehir: Kirsehir (Bytinski-Salz, 1956 sub *Ocnera quadricollis* Brllé). vil. Konya: Konya, 1906, Lendl leg. (Kaszab, 1938 sub *Pachyscelis cycladica* Reitt.); Toros, Berendi-Eregli, 2000 m (Kaszab, 1961 sub *Pachyscelis quadricollis smyrnensis* Kr.).

UNIDENTIFIED ANATOLIAN LOCALITIES. Karasehir, 1906, Lendl leg. (Kaszab, 1938 sub *Pachyscelis cycladica* Reitt.). Sünande, 1906, Lendl leg. (Kaszab, 1938 sub *Pachyscelis cycladica* Reitt.).

TAXONOMIC REMARKS

A number of subspecies are known for this species (cf. Koch, 1948). According to Koch (1948), the Anatolian populations should be referred to ssp. *smyrnensis* Kraatz, 1865. However, the various populations of this monotypic genus are in need of revision and for the time being we have considered this species without regard to subspecific taxa.

RANGE

Greece, Greek Islands (Zakynthos, Skyros, Anaphi, Megalo Phthena near Anaphi, Kythnos, Siphnos, Milos, Pholegandros, Sikinos, Ios, Amorgos, Kardiotissa, Syra, Paros, Andros, Tinos, Naxos, Apano Kupho near Naxos, Herakleia, Keros, Santorin, Apronisi near Santorin, Samos, Kos, Crete) (Kühnelt, 1965; Grimm, 1981), Anatolia and perhaps European Turkey (Koch, 1948; Kwieton, 1986). East Mediterranean chorotype.

8. **Pimelia (Camphonota) akbesiana** Fairmaire, 1884

MATERIAL EXAMINED

vil. Afyon: Emirdag, 1.VII.1986, L. Falletti leg., 1 (CL). vil. Antalya:, Elmali, 18.V-6.VI.1984, G. Drioli leg., 1 (CL); Antalya, between Korkuteli and Kemer, Souguk env., near Seki, 1400 m, 30.IV.1982, M. Bologna leg., 2 (1 CL, 1 MZUR); idem, 30.IV.1982, C. Manicastri leg., 1 (MZUR). vil. Budur: Budur, Çavdir, 1000 m, 5.IV.1991, M. Bologna leg., 1 (MZUR); S Aglasun hill, 1090 m, 18.VII.1992, Mazzi leg., 3 (CL). vil. Eskisehir: 10-20km E Eskisehir, 900 m, 10.V.1991, M. Bologna leg., 2 (1 CL; 1 MZUR). vil. Içel: between Silifke and Mut, 18.V.1989, P. Robert leg., 1 (CL); Mut, 400 m ca, 8.VI.1986, P. Audisio leg., 4 (MZUR); Namrun, VI.1983, P. Schurmann leg., 2 (CL). vil. Konya: Beisehir, 28.VI.1986, L. Falletti leg., 3 (CL); Golveren, 15.VI.1995, Poletti leg., 1 (CS); Kadinhani, 1100 m, 7.VI.1986, M. Bologna leg., 1 (MZUR); Sertavul geçidi, 1400-1600 m, 8.VI.1986, M. Bologna leg., 4 (2 CL; 2 MZUR); Sertavul geçidi, 1600 m, 28.V.1981, G. Sama leg., 3 (MZUR);

Sertavul geçidi, 1610 m, 25.IV.1973, A. Vigna leg., 2 (sub *P. akbesiana* Kaszab det., 1978) (MZUR); Sertavul geçidi, 1650 m, S. Dacatra leg., 4 (CL). vil. K. Maras: 15 km E Elbistan, 1500 m, 18.VI.1986, M. Bologna leg., 1 (MZUR). vil. Nigde: between Nigde and Pozanti, Kolsuz geçidi, 1450 m, 19-22.V.1989, P. Robert leg., 3 (1 CL; 2 CME).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Isparta: N Davraz Dag, 1500 m, 17.VII.1992, Mazzi leg., 2 (CL). vil. Konya: Belpinar Beli, m 1850, S. Dacatra leg., 2 (CL).

LITERATURE DATA

vil. Adana: Adana (Kwieton, 1982); Hasanbeyli, Amanus, 14. IV. 1966, 1 (Kaszab, 1968). vil. Gaziantep: Akbez (Kwieton, 1982). vil Hatay: Nurdagh-Tepesi, 1150 m, Petrovitz-Ressl leg., 5 (Kaszab, 1968). vil. Içel: Bolkar Daghlari (= Bulgar-Dagh.) (Kwieton, 1982). vil. Karaman: Karaman, Habiller (Kaszab, 1961). vil. Konya: Aksehir (= Ak-Chehir); Eregli (Kwieton, 1982); Konya, 1906, Lendl leg. (Kaszab, 1938); Konya; Sille (Kwieton, 1982); Toros, Berendi Eregli, 2000 m (Kaszab, 1961). vil. K. Maras: Maras (= Marash) (Kwieton, 1982). vil. Nidge: Ulukisla env., 1500-2000 m (Kaszab, 1961).

REGIONAL ANATOLIAN DATA. Amanus; Cilicia; Lycia (Kwieton, 1982).

UNIDENTIFIED ANATOLIAN LOCALITIES. Aintab (Kwieton, 1982). Bos-Dagh, 1906, Lendl leg. (Kaszab, 1938). Bulgar-Maaden (Kwieton, 1982). Bunar-Basi,

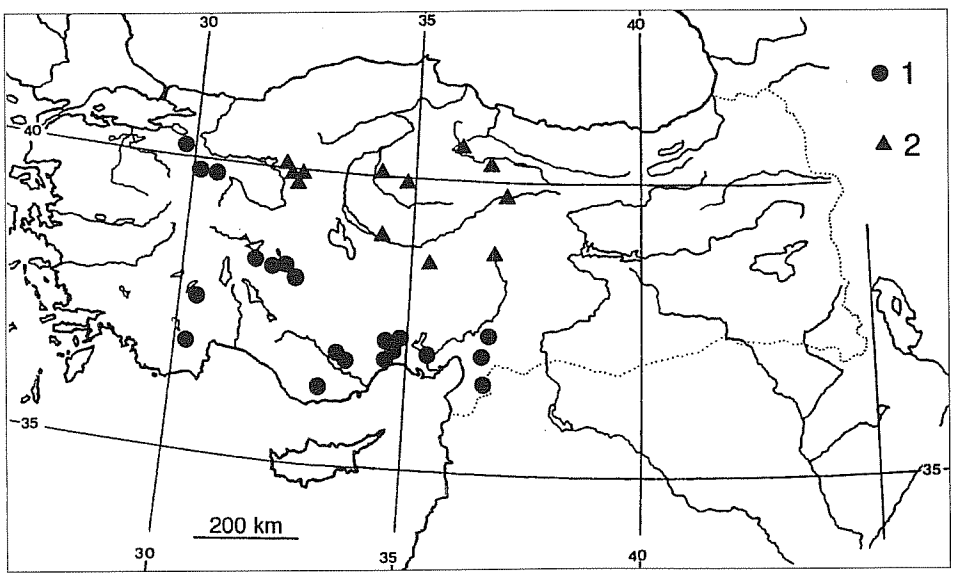

Fig. 8 - Distribution of *Pimelia akbesiana* Fairmaire (1) and *P. timarchoides* Ménétriés (2).

1906, Lendl leg. (Kaszab, 1938). Inönü, 1906, Lendl leg. (Kaszab, 1938). Karaköi (there are at least 15 localities named "Karaköy" in 12 different vilajets), 1906, Lendl leg. (Kaszab, 1938). Mortana (Kwieton, 1982). Sünande, 1906, Lendl leg. (Kaszab, 1938). SW Ismit, 6. IV. 1966, 1 (Kaszab, 1968). Zeitoon (Kwieton, 1982).

TAXONOMIC REMARKS

This species seems to be strictly related to *P. timarchoides* Ménétriés, 1832. In fact, their clearly peripatric distribution (see below) and high overall similarity suggest that they could be sister species or subspecies. Due to the high state variability of the elytral feature in the subgenus *Camphonota*, *P. akbesiana* ssp. *evanescens* Kwieton, 1982, described from Bilecik (vil. Bilecik) on the basis of differences in the elytral sculpture, could be a synonym of *P. akbesiana*. However, further studies are needed in order to verify whether or not this taxon is synonymous to the nominal form of *P. akbesiana*.

RANGE

Endemic to the Anatolian peninsula. East Mediterranean chorotype.

9. Pimelia (Camphonota) repleta Reitter, 1915

MATERIAL EXAMINED

Holotype labelled as follows: "Armenia turcica, Pular [or Pulur?], Beiburt-

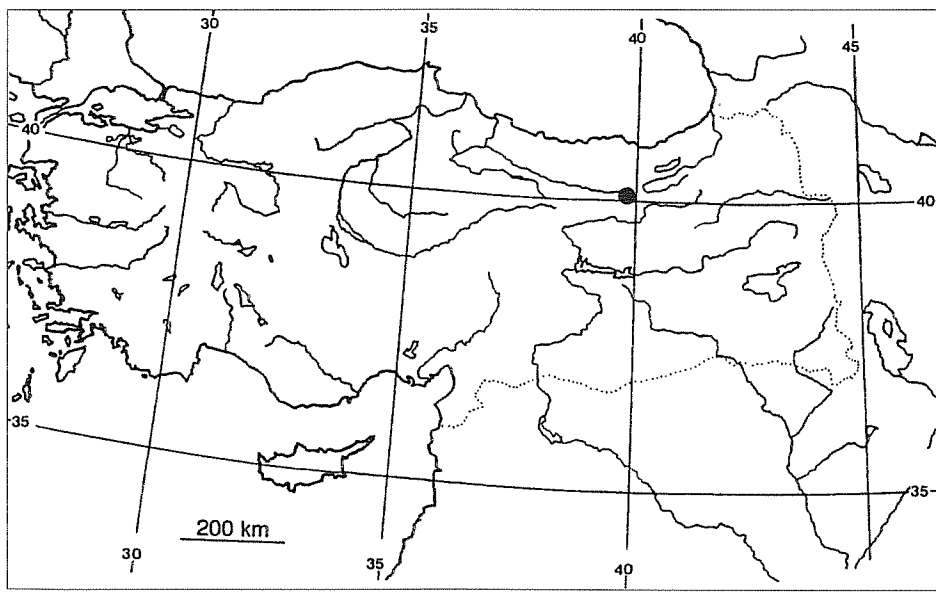

Fig. 9 - Distribution of *Pimelia repleta* Reitter.

Erzingian [sic!], Rost [sic!], Typus *Pimelia repleta* Rtt., Coll. Reitter", 1 male. (HNHM).

P. repleta is known by only the holotype from an area probably between Bayburt and Erzincan.

LITERATURE DATA

"Türkisch-Armenien" (Reitter, 1915).

Kwieton (1982) cited this species as follows: "Beiburcu-Erzingian [sic!] (type), "Mortana, Taurus, Reitter" - coll. Mus. nat. Prag.". However, no specimens of *P. repleta* were found in the Prague Museum (Jelinek, in litteris 1997), while a specimen labelled as typus (see above) is preserved in the Hugarian Natural Hystory Museum. The origin of "Mortana, Taurus, Reitter" is a mystery.

TAXONOMIC REMARKS

Based on the examination of the type specimen of *P. repleta*, we are of the opinion that *Pimelia (Camphonota) monikovae* Kwieton, 1982 may be a synonym of *P. repleta*. Unfortunately, *P. monikovae*, described from "Borian, près de Tatvan" (a locality not shown on maps available to us) is presently known only by description, the type material being apparently lost (Merkl, in litteris 1997). Therefore, examination of other materials from Eastern Turkey would be necessary in order to correctly state the true identity of *P. monikovae*.

RANGE

Endemic to the Anatolian peninsula. East Mediterranean chorotype.

10. Pimelia (Camphonota) subglobosa Pallas, 1781 group

MATERIAL EXAMINED

vil. Afyon: Heybeli baths, 20 km NW Cay, 29.IV.1992, M. Bologna and C. Marangoni leg., 1 (MZUR); between Bozan and Dinar, 880 m, 28.IV.1992, M. Bologna and C. Marangoni leg., 6 (1 CL; 5 MZUR); Sultan Dag, 28.VI.1986, L. Falletti leg., 1 (CL). vil. Ankara: Gordion env., Polatli, 890 m, 3.V.1992, M. Bologna and C. Marangoni leg., 2 (MZUR); 5 km NE Temelli, 750 m, 10.V.1991, Bologna leg., 2 (MZUR). vil. Antalya: between Korkuteli and Kemer, Souguk env., near Seki, 1400 m ca, 30.IV.1982, M. Bologna leg., 3 (MZUR); idem, 30.IV.1982, C. Manicastri leg., 1 (MZUR); idem, 30.IV.1982, M. Zapparoli leg., 1 (CL). vil. Aydin, Kusadasi, 5.VII.1987, M. Malmusi leg., 1 (CMA); Incirliova, 40 m, 27.IV.1982, M. Bologna and C. Marangoni leg., 1 (MZUR). vil. Bahkesir: Balikesir, Bigadiç, 10.VI.1981, G. Sama leg., 1 (MZUR); upper Edremir, near Kalkim, 400 m, 3.V.1991, M. Bologna and M. Zapparoli leg., 3 (MZUR). vil. Bilecik: 7 km S Bilecik, 400 m, 4.V.1992, M. Bologna and C. Marangoni leg., 2 (1 CL; 1 MZUR); 20-10 km S Sogut, 700 m, 4.V.1992, M. Bologna and C. Marangoni leg., 1 (MZUR);

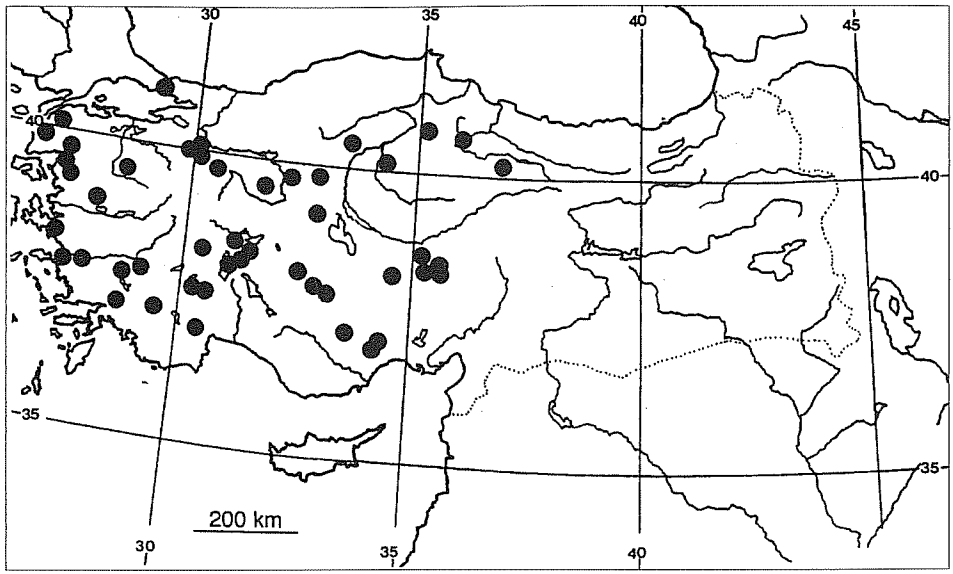

Fig. 10 - Distribution of *Pimelia subglobosa* Pallas group in Anatolia.

between Inegöl and Bozuyuk, 750-1000 m, 12.VI.1991, M. Malmusi leg., 1 (CMA). vil. Çanakkale: between Çanakkale and Truva (= Troja), 26.IV.1984, P. Audisio and M. C. Angelici, 2 (MZUR); Kirazli, 600 m, 13.VI.1991, M. Malmusi leg., 2 (CMA); Truva (= Troja), pine forest, 22.V-9.VI.1984, G. Drioli leg. 2 (CL); Truva (= Troja), 100 m, 3.V.1991, Bologna leg., 6 (2 CL, 4 MZUR); idem, 3.V.1991, M. Zapparoli leg., 1 (MZUR). vil. Çankiri: Çankiri, 14.VI.1974, Migliaccio leg., 4 (3 CMI; 1 CL); idem, 14.VI.1974, S. Bruschi leg., 1 (CL); idem, 28.V.1977, Calligaris leg., 1 (CL). vil. Çorum: Mecitozu env., 24.VI.1972, Cavazzuti leg., 2 (sub *P. testudo* Kaszab det., 1978) (MZUR); 10 km NE Çorum, 9.VI.1992, A. Ballerio leg., 1 (CL). vil. Denizli: 10 km SE Acipayam, 1100 m, M. Bologna leg., 1 (MZUR); Aphrodisias, 10.V.1985, M. Gabriele leg., 10 (CL); Aphrodisisas, 30 km W Denizli, 10.V.1978, M. Gabriele leg., 1 (MZUR); Pamukkale, 25.VI.1990, W. Pagliacci leg., 3 (CL); Pamukkale, 400 m, 29.IV.1992, M. Bologna and C. Marangoni leg., 1 (MZUR). vil. Eskisehir: 10-20 km E Eskisehir, 900 m, 10.V.1991, M. Bologna leg., 2 (MZUR); 27 km W Silvrihisar, 1100 m, 2.V.1987, M. Zapparoli leg., 1 (MZUR). vil. Isparta: Egridir Gölü, 18.V.1977, Calligaris leg., 1 (CL); Isparta, 19.VI.1981, G. Sama leg., 1 (MZUR). vil. Izmir: Bergama Acropolis, 27.IV.1984, P. Audisio and M. C. Angelici leg., 1 (MZUR); Kozak, 630 m, 26.VI.1990, A. Casale leg., 6 (CL); Urla, 10.VIII.1970, Boggio leg., 1 (CL). vil. Karaman: 10 km S Karaman, 1200 m, 7.V.1991, M. Bologna leg., 1 (MZUR); 7 km S Karaman, 1200 m, 30.IV.1992, M. Bologna and C. Marangoni leg., 5

(2 CL; 3 MZUR). vil. Kayseri: Erciyas Dag., N slope, 2000-2400 m, 25-26.V.1988, P. Audisio and M. Zapparoli leg., 3 (MZUR); idem, 25-26.V.1988, M. Zapparoli leg., 2 (CL); Erciyea cagi, 2000-2350 m, 19.VI.1986, P. Audisio leg., 2 (MZUR); 38 Km NW Kayseri, 1100 m, 7.V.1999, P. Audisio and A. De Biase leg., 1 (MZUR); between Urgup and Develi, 15.V.1989, P. Robert leg., 6 (2 CL; 4 CME). vil. Konya: hill between Aksehir and Bagkonak, 1600 m, 25.VII.1991, Mazzi leg., 1 (CL); 5 km S Çumra, 1100 m, 7.V.1991, M. Bologna and M. Zapparoli leg., 2 (MZUR); 10 km W Kulu 950 m, 3.V.1992, M. Bologna and C. Marangoni leg., 4 (MZUR); Konya env. (North), 28.V.1981, G. Sama leg., 2 (MZUR); Kadinhani, 1100 m, 7.VI.1986, M. Bologna leg., 1 (MZUR). vil. Manisa: Akhisar, 28.V.1974, G. Sama leg., 3 (CL); idem, 28.V.1974, E. Migliaccio leg., 2 (CMI). vil. Mugla: Yatagan env., 30.IV.1973, A. Vigna leg., 8 (2 CL, 6 MZUR). vil. Nidge: Huyuk, between Nidge and Kayseri, 1400 m, 8.V.1991, P. Audisio, M. Biondi and M. Bologna leg., 6 (4 MZUR; 2 CL).

UNIDENTIFIED ANATOLIAN LOCALITIES. vil. Isparta: Çobanisa, Davraz Dag, 1250 m, 5.VII.1991, Mazzi leg., 3 (CL).

LITERATURE DATA

vil. Afyon: Sultandagi (Kwieton, 1982 sub *P. subglobosa salaria* Reitter). vil. Amasya: Amasya (Kwieton, 1982 sub *P. testudo* Kraatz). vil. Ankara: Ankara (Kwieton, 1982 sub *P. testudo* Kraatz); Ankara, 22.IV.1911, Náday leg., 1 (Kaszab, 1938 sub *P. lendli*). vil. Bilecik: Bilecik (Kwieton, 1982 sub *P. testudo* Kraatz); 26 km N Bilecik, Petrovitz-Ressl leg., 2 (Kaszab, 1968 sub *P. anatolica* Reitt.). vil. Burdur: Burdur, Petrovitz-Ressl leg., 1 (Kaszab, 1968 sub *P. anatolica* Reitt.); Burdur (Kwieton, 1982 sub *P. subglobosa salaria* Reitter). vil. Denizli: Bozdag (Kwieton, 1982 sub *P. subglobosa polita* Solier). vil. Eskisehir: Eskisehir, 1906, Lendl leg. (Kaszab, 1938 sub *P. anatolica* Reitt.); idem, 1906, Lendl leg. (Kaszab, 1938 sub *P. verruculifera*, Sol.); Eskisehir (Kwieton, 1982 sub *P. subglobosa salaria* Reitter); between Eskisehir and Kütahya, Petrovitz-Ressl leg., 1 (Kaszab, 1968 sub *P. anatolica* Reitt.). vil. Izmir: Izmir (Kwieton, 1982 sub *P. subglobosa verruculifera* Solier); Efes (= Ephesos) (Kwieton, 1982 sub *P. subglobosa verruculifera* Solier). vil. Karaman: Toros, Karaman-Habiller (Kaszab, 1961 sub *P. testudo* Kr.); idem (Kwieton, 1982 sub *P. testudo* Kraatz). vil. Kayseri, Erciasdag-Sattel near Kayseri, 2300 m, 5.VI.1966, 20 (Kaszab, 1968 sub *P. verruculifera* Sol.); idem (Kwieton, 1982 sub *P. subglobosa salaria* Reitter); Kayseri (Kwieton, 1982 sub *P. subglobosa salaria* Reitter); between Kayseri and Yesilhisar, 7.VI.1966, 3 (Kaszab, 1968 sub *P. verruculifera* Sol.). vil. Konya: Aksehir (= Ak-Chehir) (Kwieton, 1982 sub *P. testudo* Kraatz); idem (Kwieton, 1982 sub *P. subglobosa salaria* Reitter); Ayranci, SW Eregli, 9.VI.1966, 1 (Kaszab, 1968 sub *P. verruculifera* Sol.); Eregli (Kwieton, 1982 sub *P. subglobosa salaria* Reitter); Konya

(Kwieton, 1982 sub *P. testudo* Kraatz and sub *P. subglobosa salaria* Reitter). vil. Mugla: Mugla (Kwieton, 1982 sub *P. subglobosa polita* Solier). vil. Tokat: Tokat (Kwieton, 1982 sub *P. subglobosa salaria* Reitter).

UNIDENTIFIED ANATOLIAN LOCALITIES. Agaboz, 22.IV.1911, Náday (Kaszab, 1938 sub *P. anatolica* Reitt.). Bunar Basi, 1906, Lendl leg. (Kaszab, 1938 sub *P. verruculifera*, Sol.). vil. Izmir: Bornova, near Izmir, Petrovitz-Ressl leg., 5 (Kaszab, 1968 sub *P. verruculifera* var. *tomentifera* Reitt.); Selcuk- Izmir, Petrovitz-Ressl leg., 2 (Kaszab, 1968 sub *P. polita* Sol.). Kara-Sehir, 1906, Lendl leg. (Kaszab, 1938 sub *P. verruculifera*, Sol.); idem, 1906, Lendl leg. (Kaszab, 1938 sub *P. anatolica* Reitt.). Karayinam (Kwieton, 1982 sub *P. subglobosa salaria* Reitter). vil. Kayseri: between Ürgüp and Göreme, 6.VI.1966, 3 (Kaszab, 1968 sub *P. verruculifera* Sol.). Kotya-Kyr (Kwieton, 1982 sub *P. subglobosa salaria* Reitter). Mogan gölü, 8.VII.1947, 1 (Kaszab, 1960 sub *P. lendli* Kaszab, 1938). Rodosto, 24.VII.1936 (Kaszab, 1939 sub *P. verruculifera* Sol. and *P. verruculifera* var. *tomentifera* Reitt.); Rodosto (Kwieton, 1982 sub *P. subglobosa verruculifera* Solier). Tshajan, 1906, Lendl leg. (Kaszab, 1938 sub *P. verruculifera*, Sol.).

TAXONOMIC REMARKS

Based on the examination of both Anatolian and Greek materials, a number of populations, presently known as distinct species, could be referred to *P. subglobosa*. Indeed, *P. lendli* Kaszab, 1938 (described from Ankara) and *P. salaria* Reitter, 1915 (already regarded as a subspecies of *P. subglobosa* by Kwieton, 1982) are probably synonyms of *P. testudo* Kraatz, 1865, which, in turn, could be a subspecies of *P. subglobosa*. Also, *P. mongeneti* Solier, 1836 and *P. verruculifera* Solier, 1836 are probably synonymous with *P. polita* Solier, 1836, which (as stated by Kwieton, 1982) is a probable subspecies of *P. subglobosa*. Likewise, we are of the opinion that *P. euboica* Boieldieu, 1865 could be a true subspecies of *P. subglobosa*. Finally, a population from Malatya could be a new species related to *P. subglobosa* or a new subspecies of this species. At this time, we have provisionally referred all these taxa (*i.e.*, *P. lendli*, *P. salaria*, *P. verruculifera*, *P. mongeneti*, *P. polita*, and *P. euboica*) to *P. subglobosa*, but further studies are needed in order to clarify their actual taxonomic status.

RANGE

Anatolia, Thrace Bulgaria, Crimea, Kazakhstan, Ural Mountains, Greece, Greek Islands (Kephalonia, Euboea, Skyros, Kea, Naxos, Thasos, Lemnos, Samos, Lesvos, Rhodos) (Kühnelt, 1965; Kwieton, 1982). Reports from Cyprus (Kwieton, 1982 sub *P. subglobosa verruculifera* and *P. subglobosa polita*) and Iran ("Elbrus Geb., Persien, Reitter", Kwieton, 1982 sub *P. testudo* Kraatz) are clearly wrong. East Mediterranean chorotype.

11. Pimelia (Camphonota) timarchoides Ménétriés, 1832

MATERIAL EXAMINED

vil. Amasya: Merzifon, 27.VI.1971, S. Battoni leg., 1 (CL). vil. Çorum: Bogazkale env., 1150 m, 10.VII.1975, E. Colonnelli and S. Sacco leg., 2 (MZUR); Bogazkale, 15.VII.1971, A. Vigna leg., 1 (sub *P. akbesiana*, Kaszab det. 1975) (MZUR). vil. Kayseri: 38 Km NW Kayseri, 1100 m, 7.V.1999, P. Audisio and A. De Biase leg., 1 (MZUR). vil. Sivas: 8 km W Zara, 31.V-18.VI.1998, G. Sama leg., 1 (CL); Ziyaret geçidi, 41 km W Gurun, 1800-2000 m, 25.V.1988, M. Zapparoli leg., 2 (1 MZUR; 1 CL). vil. Yozgat: Yozgat, 30.VI.1990, L. Falletti leg., 7 (CL).

LITERATURE DATA

vil. Amasya: Amasya (Kwieton, 1982). vil. Ankara: Ankara, 13.VI.1925, Biró leg. (Kaszab, 1938); idem, 26.V.1937, 9 (Kaszab, 1939); Ankara (Kwieton, 1982); Ayas, 17.VII.1947 (Kaszab 1959); Ayas (Kwieton, 1982); Beynam, 28.VI.1947 (Kaszab 1959); Beynam (Kwieton, 1982); Gölbasi (Ankara), 25.V.1967, 1 (Kaszab, 1968). vil. Kirsehir: Mucur, 22.VII.1947 (Kaszab 1959); Mucur (Kwieton, 1982). vil. Sivas: Sivas, 5.VI.1967, 1 (Kaszab, 1968). vil. Tokat: Tokat (Kwieton, 1982). vil. Yozgat: Yozgat, 28-29.V.1967, 3 (Kaszab, 1968); Yozgat (Kwieton, 1982).

UNIDENTIFIED ANATOLIAN LOCALITIES. Agaboz, 22. VI. 1911, Náday leg. (Kaszab, 1938). vil. Ankara: Ankara-Baraj, 3-4.VII.1947 (Kaszab 1959). Kadiköi (there are at least 13 localities named "Kadiköy" in 12 different vilayets), 25.VIII.1906, Lendl leg. (Kaszab, 1938). Kurcunlu (there are at least 7 localities named "Kursunlu" in 6 different vilayets) (Kwieton, 1982).

RANGE

Endemic to the Anatolian peninsula. East Mediterranean chorotype.

12. Pimelia (Gedeon) werneri Ganglbauer, 1905

MATERIAL EXAMINED

vil. Kayseri: Erciyas Dag, 10.VIII.1982, L. Falletti, leg. 8 (CL). vil. Malatya: Malatya, X.1975, C. Placidi leg., 2 (MZUR). vil. Maras: SE Cappadocia, Alisar, 30.VII.1962, Perissinotto leg., 1 (CL). vil. Nigde: Nigde env., VIII.1991, Magazzini leg., 8 (CL).

REGIONAL ANATOLIAN DATA. Tuz Gölü, 18.IV.1976, E. Migliaccio leg., 1 (CMI).

UNIDENTIFIED ANATOLIAN LOCALITIES. Kasangazi, 1500 m, 13.VIII.1985, Cerutti and Barbero leg., 7 (2 CL; 5 CME).

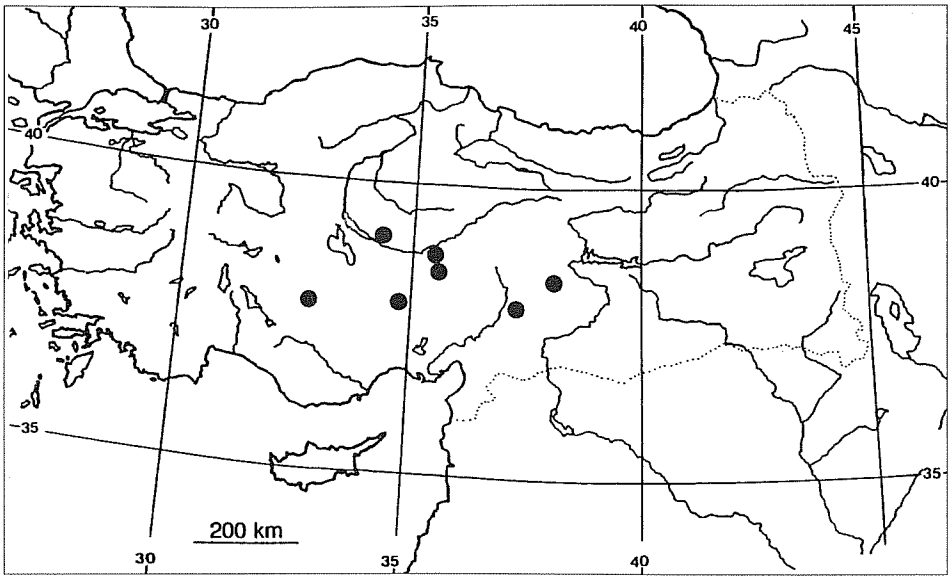

Fig. 11 - Distribution of *Pimelia werneri* Ganglbauer.

LITERATURE DATA

vil. Kirsehir: Kirsehir (Bytinski-Salz, 1956); Mucur, 22.VII.1947, 20 (Kaszab 1959). vil. Konya: Konya, 1906, Lendl leg. (Kaszab, 1938).

REGIONAL ANATOLIAN DATA. Tuz Gölü (Bytinski-Salz, 1956).

UNIDENTIFIED ANATOLIAN LOCALITIES. Bos-Dagh, 1906, Lendl leg. (Kaszab, 1938). Bunar-Basi, 1906, Lendl leg. (Kaszab, 1938). vil. Malatya, Malatya, Sultansuju Hara, VI.1937, 1 (Kaszab, 1939). Tshajan, 1906, Lendl leg. (Kaszab, 1938).

RANGE

Endemic to the Anatolian peninsula. Turano-Mediterranean chorotype.

13. **Pimelia (Pimelia) bajula** Klug, 1830 ssp. **solieri** Mulsant, 1852

MATERIAL EXAMINED

vil. Adana: near Adana, 31.IX.1998, L. Latella leg., 1 (CF); Karatas, 1.V.1991, L. Falletti leg., 1 (CL); Nurdagi Geçidi, 1150 m, 27.VI.1971, P. Brignoli leg., 2 (MZUR). vil. Antakya: Guvenç, 4.VI.1981, G. Sama leg., 1 (MZUR); Hassa, 4.VI.1981, G. Sama leg., 6 (1 Cl, 5 MZUR); pass between Iskenderum and Kirikhan (Belern), 16-17.XI.1981, A. Vigna leg., 1 (MZUR); Kirikhan env., 100 m, 17.XI.1981, S. Bruschi leg., 1 (MZUR). vil. Bahkesir: upper Edremit, 400

m, 3.V.1991, M. Biondi leg., 2 (CO). vil. Hatay: Belen, 4.VIII.1997, P. Crucitti leg., 3 (CF). vil. Gaziantep: Islahiye, 3-4.V.1981, G. Sama leg., 6 (2 CL, 4 MZUR). vil. Içel: Ayatekla, Silifke env., 40 m, 21.XI.1981, A. Vigna leg., 1 (MZUR); between Kargicak and Silifke, 150 m, 30.IV.1992, M. Bologna and C. Marangoni leg., 3 (1 CL; 3 MZUR); ruins of Silifke Castle, 100 m, 21.XI.1981, A. Vigna leg., 2 (MZUR); between Tarsus and Gukek, 500 m, Tasobagi env., 20.XI.1981, A. Vigna leg., 1 (MZUR); vil. Maras: Goksun env., VIII.1982, L. Falletti leg., 1 (CL).

REGIONAL ANATOLIAN DATA. Tuz Gölü, 18.IV.1976, E. Migliaccio leg., 3 (CMI).

CYPRUS: Ayia Napa, 11.IV.1996, S. Ziani leg., 1 (CL).

LITERATURE DATA

vil. Adana: Hasanbeyli, Amanus mountain, 14.IV.1966, 1 (Kaszab, 1968). vil. Diyarbakir: 40 km S Diyarbakir, 4.V.1966, 1 (Kaszab, 1968). vil. Gaziantep: Baspinar, W Gaziantep, 26.IV.1966, 1 (Kaszab, 1968); between Gaziantep and Kilis, 27.IV.1966, 11 (Kaszab, 1968); Sakçagözü, 17.VIII.1947 (Kaszab 1959). vil. Hatay: Belen, Issus pass, Amanus, 18. IV. 1966, 2 (Kaszab, 1968). vil. Içel: Mersin, 25.VIII.1947 (Kaszab 1959); Taurus-Toros, Mut (Kaszab, 1961). vil. K. Maras: Maras, Petrovitz-Ressl, 2 (Kaszab, 1968). vil. Mardin: Mardin, 1937, 2 (Kaszab, 1939); Mardin env., 5.V.1966, 1 (Kaszab, 1968); 35 Km N Mardin,

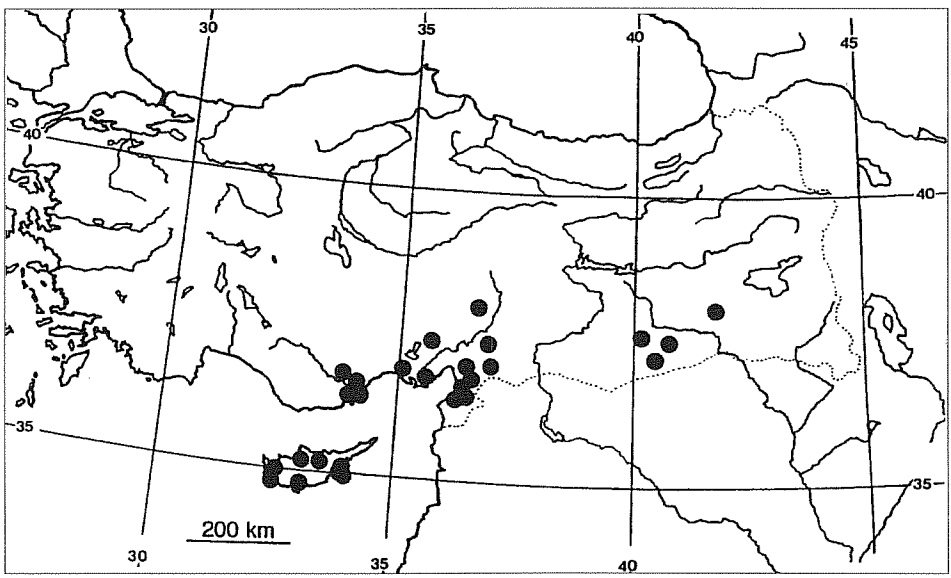

Fig. 12 - Distribution of *Pimelia bajula* Klug ssp. *solieri* Mulsant in Anatolia.

1000 m, 4.V.1966, 2 (Kaszab, 1968). vil. Siirt: between Siirt and Kurtalan, 16.V.1966, 1 (Kaszab, 1968).

UNIDENTIFIED ANATOLIAN LOCALITIES. Alahan, Toros, 29.VIII.1947 (Kaszab 1959). vil. Gaziantep: Buro near Gaziantep, 29.IV.1966, 1 (Kaszab, 1968). Kozan, Toros, 8-9.VIII.1947 (Kaszab 1959). vil. Mardin, between Midyat and Idil, 9-11.V.1966, 2 (Kaszab, 1968). Nurdag-Tepesi, Amanus, 26.IV.1966, 1; Nurdagh-Tepesi, 1150 m, Petrovitz-Ressl leg., 7 (Kaszab, 1968).

CYPRUS: Cyprus III, V, XII 1927-1968 (Georghiou, 1977), Akaki, V. 1977, G. Alziar leg.; idem, V.1978, G. Alziar leg.; Ayia Irini, X.1953; Ayia Napa, VI. 1984; Famagusta; Limassol; Nicosia, X.1953; Paphos, XII.1988, R. Grimm and A. Rachinsky leg.; Polis, XII.1988, R. Grimm and A. Rachinsky leg.; Xylophagou, IV.1988 (Grimm, 1991; and references therein).

RANGE

This species includes two subspecies. The nominal form is distributed in Lebanon, Palestine and Jordan, ssp. *solieri* in Anatolia, Cyprus, Syria, Kurdistan, and Western Iran (Reitter, 1915; Pierre, 1964; Kwieton, 1986; Grimm, 1991; pers. obs.). According to Kwieton (1977), *P. zarudnyi* Bogacev, 1953, described from Iran, should be regarded as a subspecies of *P. bajula*. South West Asiatic chorotype.

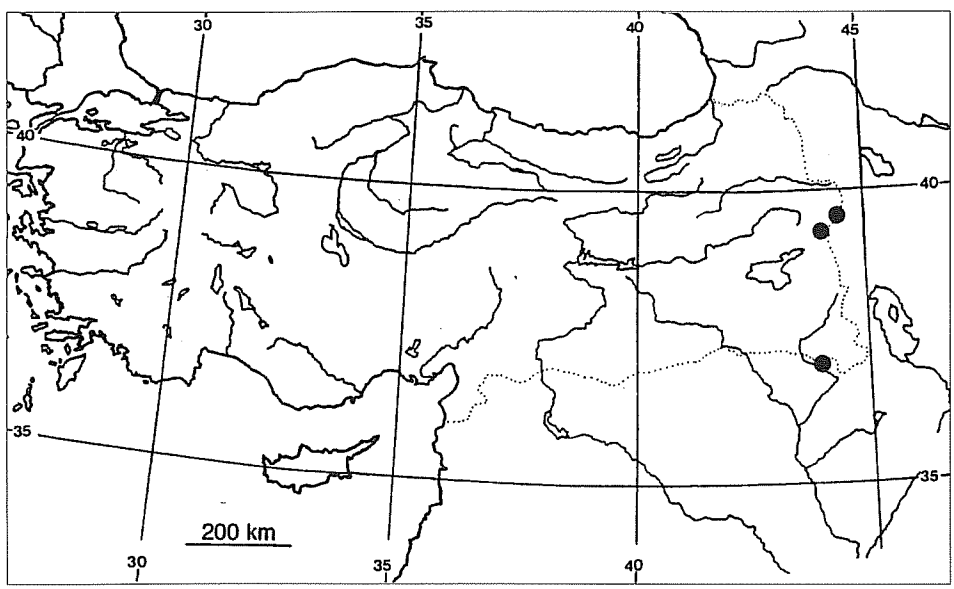

Fig. 13 - Distribution of *Pimelia dubia* Faldermann in Anatolia.

14. Pimelia (Pimelia) dubia Faldermann, 1837

MATERIAL EXAMINED

vil. Agri: Agri Dag (W slope), E Cilli geç., 1900-2050 m, 22.V.1988, P. Audisio leg., 2 (MZUR); idem, 1900-2050 m, 22.V.1988, M. Zapparoli leg., 1 (CL); idem, 1900-2050 m, 22.V.1988, M. Zapparoli leg., 3 (MZUR); Dogubayazit, Ishak Pasa Sarayi, 1900-2000 m, 22.V.1988, M. Zapparoli leg., 1 (MZUR).

LITERATURE DATA

vil. Hakkari: Yüksekova, 23.V.1966, 1 (Kaszab, 1968).

RANGE

Eastern Turkey, Northern Iran?, Caucasus? (Gebien, 1937; Kwieton, 1986). Endemic to the Anatolian peninsula? Turanian chorotype.

15. Pimelia (Pimelia) robusta Kraatz, 1865

LITERATURE DATA

vil. Mardin: 35 km N Mardin, 1000 m, 4. V. 1966, 1 (Kaszab, 1968).

REGIONAL ANATOLIAN DATA. Amasya, Erzurum, Mardin (Reitter, 1915).

RANGE

This species is known by only the localities cited above. Citations by Gebien

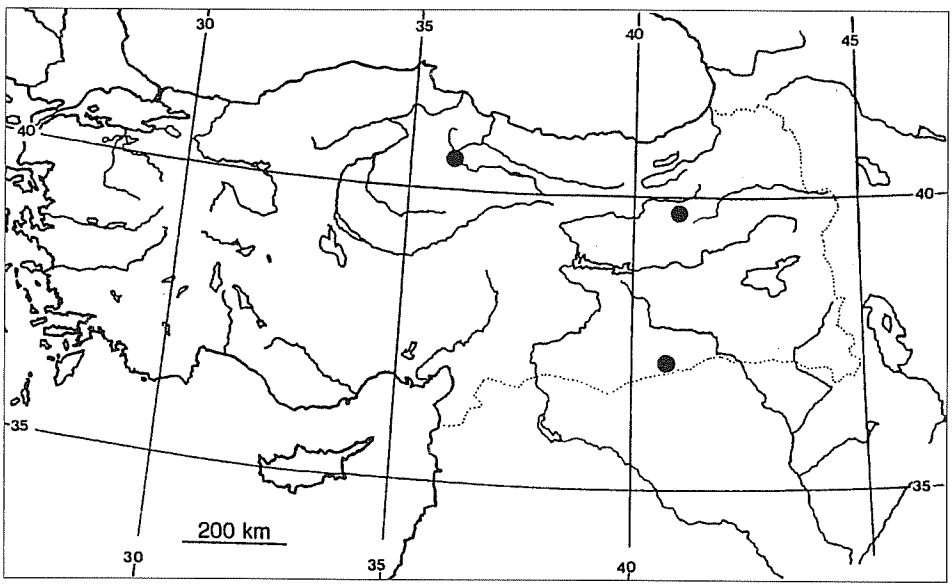

Fig. 14 - Distribution of *Pimelia robusta* Kraatz.

(1937) for Armenia and Kurdistan have to refer to Erzurum and Mardin respectively. Endemic to the Anatolian peninsula. Turanian chorotype?

FAUNAL COMPOSITION AND AFFINITY

The Anatolian Pimeliini consist of at least 15 species belonging to 5 genera. Two taxa, presently recorded as species (*P. timarchoides* and *P. akbesiana*) could be subspecies of the same species. Another taxon (*T. hispida*), quoted from some Anatolian localities, could be an introduced species, and, for the time being present, we refrain from considering it a native component of the Anatolian fauna. Also, the *P. subglobosa*-group includes a number of Anatolian populations forming probably three subspecies. Finally, a well characterized population from Malatya could be a new species related to *P. subglobosa* or a new subspecies of this species. Further studies are required before the taxonomic status of these populations can be clarified. The species are now discussed according to their zoogeographical affinities.

IRANO-TURANIAN SPECIES

Three species, known from Eastern Anatolia, can be regarded as Irano-Turanian elements. However, this group is not homogeneous but composed of a Transcaucasian species (*T. setosa*), and two South Caspian-Iranian species: *P. musiva*, which is widely distributed in the Southern Caspian area, and *P. dubia*, distributed in Eastern Turkey and, perhaps, in Caucasus and Northern Iran. From a practical point of view, *T. setosa* and *P. dubia* can be referred to the Turanian chorotype, while *P. musiva* to the South West Asiatic chorotype.

MEDITERRANEAN SPECIES

This group includes a number of species more or less widespread in the Mediterranean area, sometimes involving (as extensions of their main distribution range) other areas.

For example, *T. lima* is a typically Mediterranean species. By contrast, *T. philistina* is a very widely distributed species, and its range could be properly regarded as a North East African-Sindian chorotype. However, this species shows a continuous distribution along the countries facing the Mediterranean basin, and its occurrence in other areas should be regarded as extensions of this basic distribution pattern.

Likewise, the *P. subglobosa*-group is distributed from the Aegean area to the Ural Mountains, showing a distribution pattern which could be referred to the East Mediterranean chorotype with a Turanian extension.

By contrast, *P. villosa* and *G. quadricollis* show a more restricted distribution range, only occurring in the Aegean area, and their distribution can be regarded as an East Mediterranean chorotype restricted to Eurasian areas.

Finally, *P. bajula* is a clearly Mesopotamian taxon, distributed from Palestine to Western Iran and its distribution range can be regarded as a Mediterranean restriction of a South West Asiatic chorotype.

ENDEMIC AND MICROENDEMIC SPECIES

The definition of an endemic is entirely arbitrary and dependent on the extent of the region considered and the knowledge of adjacent regions. Following Huggett (1998), we distinguished endemic and microendemic species.

Endemic species include Pimeliini which are distributed in various areas within the Anatolian peninsula but which are found nowhere else. These species are: *P. timarchoides* (which occurs in Northern Anatolia) and its relative *P. akbesiana* (distributed in Western and Southern Anatolia), as well as *P. werneri* (endemic to the Central Anatolian plateau) and *P. robusta* (which is confined to a few sites in Turkish Armenia and Kurdistan).

By contrast, microendemic species have an extremely restricted distribution, living as a single population in a small area. Among the Anatolian Pimeliini, *P. repleta*, presently known only from the type locality in Turkish Armenia, and *S. nicomedia*, known only from Amasya, are microendemic species. The undescribed Malatya population could be a third microendemic taxon.

Distribution patterns of endemic and microendemic species have to refer to general chorotypes according to their phylogenetic relationships (Vigna Taglianti et al., 1999). *S. nicomedia* has its probable relative in Transcaucasus, and so it should be referred to a Turanian chorotype. Taking into account the general distribution of the subgenus *Camphonota*, *P. repleta*, *P. timarchoides* and *P. akbesiana* should be regarded as belonging to a Mediterranean chorotype. As to *P. werneri*, this species belongs to a subgenus with an apparently strange distribution, occurring in Egypt, Syria, Arabia, Mesopotamia, Southern Iran, Kurdistan and Turkestan (Bukhara) (cf. Reitter, 1915; Gebien, 1937; Kaszab, 1982). Unfortunately, phylogenetic relationships among the species belonging to this subgenus are unknown. Provisionally, we can refer this species to the Turano-Mediterranean chorotype. *P. robusta* is a species of unknown phylogenetic relationships and it is absolutely impossible to state any zoogeographical affinity.

DISTRIBUTION WITHIN THE ANATOLIAN PENINSULA

The distribution of Pimeliini species within the Anatolian peninsula is not uniform, but three groups of species can be recognized according to their distribution: species widely distributed in Western and Central Anatolia (*P. villosa*, *G. quadricollis*, and *P. subglobosa*-group); species restricted to Central or South Central Anatolia (*T. philistina*, *P. akbesiana*, *P. timarchoides*, *P. bajula* and *P. werneri*); species restricted to Eastern Anatolia (*S. nicomedia*, *T. setosa*, *P. musiva*, *P. repleta*, *P. robusta*, and *P. dubia*). As to the endemics, three endemic species are known from

Central Anatolia (*P. akbesiana*, *P. timarchoides* and *P. werneri*) and three (*S. nicomedia*, *P. repleta* and *P. robusta*) from eastern areas. Detailed distributions, based on both literature data and material examined, are reported in Figs 1-14.

CONCLUSIONS

As a whole, the Anatolian Pimeliini belong to at least five chorotypes (Vigna Taglianti et al., 1999): Turanian, North East -African-Sindian, South West Asiatic, Mediterranean and East Mediterranean. Let us remark that chorotypes are based on present distributions, not necessarily involving the origin of these elements; therefore, they could be not indicative of faunal origin. For example, present Mediterranean elements could be "Irano-Turanian" in origin. Indeed, based on its present distribution, the subgenus *Camphonota* should be regarded as a Mediterranean element, but it is possible that this subgenus originated from an Iranian ancestor (Kwieton, 1982; Leo and Fattorini, 1997); in this case, all *Camphonota* species (including the *P. subglobosa*-group) could be regarded as "Irano-Turanian" elements in origin.

However, chorotypes are useful in biogeography to study present faunal affinities among different areas. Based on the chorotypes recorded for the Turkish Pimeliini, the Anatolian peninsula is partly "Mediterranean" (10 species), partly "Irano-Turanian" (5 species) in character. In particular, *S. nicomedia*, *T. setosa*, *P. musiva*, *P. robusta*, and, perhaps, *P. dubia* (all distributed in Eastern Turkey) are "Irano-Turanian" elements (Turanian chorotype and South West Asiatic chorotype restricted to Irano-East Anatolian areas), while *T. lima*, *T. philistina*, *P. villosa*, *G. quadricollis*, *P. repleta*, *P. subglobosa*-group, *P. akbesiana*, *P. timarchoides*, *P. bajula* and perhaps *P. werneri* (distributed in Western and/or Central Anatolia) are substantially Mediterranean elements (Mediterranean, East Mediterranean, Turano-Mediterranean, North East African-Sindian chorotypes or South West Asiatic chorotype restricted to Mesopotamian areas).

As a whole, the Turanian influence seems to be greatest in Eastern Anatolia, where high altitude mountains predominate, while the Mediterranean influence seems to be strong in the Southern and Western Anatolian coastal chains. The central plateau shows a transitional character, due to the overlap of Turanian and Mediterranean elements; however, the Mediterranean elements in the central plateau could be actually of "Irano-Turanian" origin. From a more general point of view, these facts are in accordance to the main biogeographical subdivisions of the Anatolian peninsula. In fact, regional biogeographers generally agree that at least three distinct biogeographical zones are represented in Anatolia (cf. Fishelson, 1987; Werner, 1987). These zones, originally based on Köppen's climate classification and phytogeographical researches, are: (i) the Eurosiberian province (Köppen's Cf; Northern Anatolia), (ii) the relatively mesic Mediterranean

province (Köppen's Cs; Western and Southern Anatolia) and (iii) the steppic Irano-Turanian province (Köppen's BS; Central and Eastern Anatolia).

The main vegetation types that characterize these provinces can be related to both present environmental conditions and past climatic changes. A number of data showed that the boundaries between climatic zones in the Middle East were shifted vertically and horizontally during the Pleistocene. Therefore, the main present vegetation types occurring in Anatolia were greatly molded by Pleistocene and post-Pleistocene climatic changes and human disturbance (*e.g.*, Butzer, 1978). The classical theory of the correlation of the glacial periods in Northern Europe with pluvial phases in the present arid regions of the Middle East (see Kosswig, 1955 for classical biogeographical assumptions based on this theory) has been warmly criticized (for example, see references reported by Wolfart 1987). Also, it is well known that the post-Pleistocene in the Middle East was characterized by a steadily increasing aridification (*e.g.*, Por, 1987).

As to the Pimeliini, species linked to Mediterranean climate and vegetation types are presently restricted to the coastal areas, while species adapted to drier, but not necessarily hot environments are especially distributed in the inner part of the peninsula. Species linked to the Mediterranean zones could be partly favored by semi-arid Pleistocene condition, partly by post-Pleistocene aridification. Among the "Irano-Turanian" elements, species presently distributed in Anatolia along the main mountain chains of the easternmost areas, could be more favored by dry but relatively cold Pleistocene phases. Probably, these species could have reached a wide distribution through the Irano-Turanian area in such conditions, inhabiting now the Anatolian areas only at high altitudes.

Relations between general distribution ranges (*i.e.*, chorotypes) of non endemic species and distribution patterns within the Anatolian peninsula support such models. All non-endemic Anatolian Pimeliini are distributed within the Anatolian peninsula in the Mediterranean or in the Irano-Turanian provinces. The *P. subglobosa*-group partly reaches the Eurosiberian province, but its main distribution falls in the Mediterranean and Irano-Turanian provinces. This is a clearly euryoecious species, which however includes a number of subspecies, most probably adapted to different ecological conditions, as their distribution suggests. *G. quadricollis*, which shows an East Mediterranean distribution range, and *P. bajula*, which has a South West Asiatic distribution mainly restricted to the Mesopotamian area, seem to be substantially linked to the Mediterranean climate, with a small penetration into the Irano-Turanian province, while *P. villosa* occurs in both the Mediterranean and the Irano-Turanian provinces. These species could have reached their general distribution in Pleistocene, resulting now substantially restricted, in the Anatolian peninsula, to the coastal Mediterranean areas. By contrast, *T. setosa*, *P. musiva* and *P. dubia* are probably linked to relatively cold and dry

environments, as their "Turanian" general distribution suggests. These species could be favored by Pleistocene climatic changes, resulting now restricted in Anatolia to eastern high altitude areas.

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