Türk. Bit. Kor. Derg. (1985), 9: 13 - 25

Four new species of genus Zyginidia (Zyginidia) Haupt (Homoptera ; Cicadellidae) and with notes on the taxonomy and distributions of the species of this genus in Turkey

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Summary

Zygïnidia (S. Str.) Haupt material collected from the east of Bolu-Ankara-Nevşehir-Gaziantep line were studied taxonomically. It is determined that Z. (Z.) **sohrab** Zach. occupied the eastern and southeastern part of Turkey. Z.(Z.) **pullula** (Boh.) was mostly found in Central Anatolia and western Blacksea Coast Region. Material from eastern Blacksea Coast Region comprised Z.(Z.) **eremita** Zach., and three new species, namely **Z.(Z.) artvinicus sp.n., Z.(Z.) karadenizicus** sp.n. and Z.(Z.) **bafranicus** sp.n. which are described in this paper. Also a new species **Z.(Z.) emrea** sp.n. was described from Çankırı in this manuscript. The distributions of the species are shown on the map.

Introduction

In fact, the systematic study of *Zyginidia (S. Str.)* has received little attention up to day in Turkey. Only *Z.(Z.) pullula* (Boh.) and *Z.(Z.) sohrab* Zach. were reported by Linnavuori (1965) and Dlabola (1957, 1971, 1981) from Turkey. Lately these cicadellids are driving attention upon themselves by causing damage on culture plants.

In this study, specimens collected from the east of the line pass from Bolu-Ankara-Nevşehir-Gaziantep were studied. Some of the specimens were send for identification and reported to be destructive on corn and millet from Southeastern Region, on rice from Bolu an on corn from eastern Blacksea Coast Region. Some material was also collected by the author, on her

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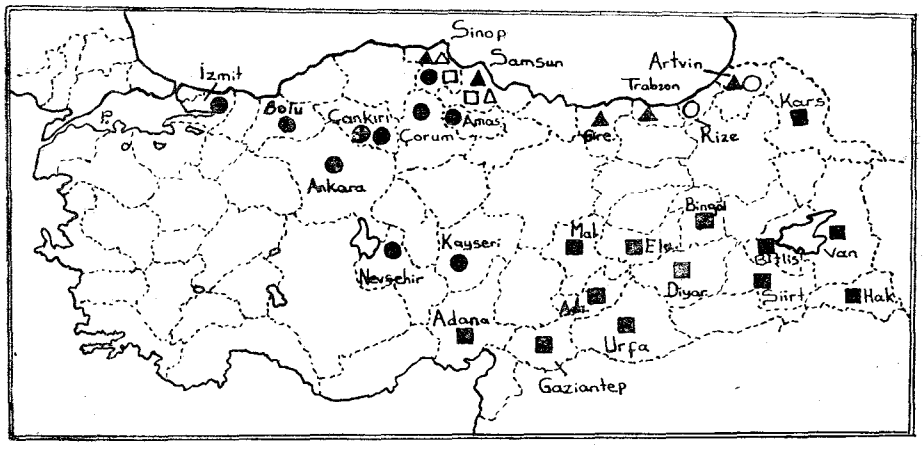
Alınış (Received) : 8.3.1984

trips to Blacksea Coast Region. Bolu and in Central Anatolia. Unfortunately, the author has no material from the west of the live given above, at the moment.

After the examination of the whole material, it is determined that the material from Eastern and Southeastern Regions, comprised only Z. *(Z.) sohrab* Zach. Any other species could not be determined, even most of the male genitalia of the large material were studied from these regions. Although, specimens of *sohrab* Zach. were reported from Bolu, İzmit, İstanbul by Dlabola (1971), I could say that this species confined to eastern and southeastern Turkey, and Mediterranean Region also could be added. This species might be found in Aegean Region, at least in the southern provinces. I can not be sure since I don't have material from that parts of Turkey. The material from the Central Anatolian Region comprised mostly Z.*(Z.) pullula* (Boh.). The specimen collected in Çankırı was found to be a new species and described in this manuscript under the name of *Zyginidia (Zyginidia) emrea* sp.n.

The material from Blacksea Coast Region, east of Sinop, was found to be completely different from the previously recorded species except Z.*(Z.) pullula* (Boh.) determined in Sinop. The material from that area yielded four different groups. One of these groups was identified as Z.*(Z.) eremita* Zach. according to Dworakowska (1970). The other three groups were determined as new species and described under the names of Z.*(Z.) artvinicus* sp.n., Z.*(Z.) karadenizicus* sp.n. and Z.*(Z.) bafranicus* sp.n. in the oflowing pages. If the determination of a few specimens of Z.*(Z.) pullula* (Boh.) from Sinop (Boyabat and Duragan) is not taken into consideration, it could be stated that the material from eastern Blacksea Coast Region did not comprised neither Z.*(Z.) pullula* (Boh.) nor Z.*(Z.) sohrab* Zach. During this study, the collected specimens from Bolu in Western Blacksea Coast was determined as Z.*(Z.) pullula* (Boh.). Since Dlabola (1971) reported Z.*(Z.) sohrab* Zach. from Bolu, İzmit and İstanbul, the fauna of this region should be studied more carefully by collecting large numbers of specimens. The distribution of *Zyginidia (Zyginidia)* species are shown on the map (Fig.1) with the addition of literature records.

The figures of the species were drawn by drawing apparatus with mirror on Leitz Wetzlar binocular by the author. The figures of aedegal and upper pygophore appendages were drawn laterally from left side and apical part of paramer dorsally at 150x magnification. Male genital plates, female pregenital sternite and the forebodies were drawn at 50x magnification. The lines besides the figures show the objective micrometer measures of 0,1 mm and 0,5 mm at 150x and 50x magnifications respectively. The figures of the



○–Z.(Z.) artvinicus sp.n. ⊕–Z.(Z.) emrea sp.n.

▲–Z.(Z.) karadenizicus sp.n. ■–Z.(Z.) sohrab Zach.

△–Z.(Z.) bafranicus sp.n. □–Z.(Z.) eremita Zach.

●–Z.(Z.) pullula (Boh.)

Fig. 1. Distribution of **Zyginidia (S. Str.)** species in eastern half of Turkey

genitalia of *sohrab* Zach., *pullula* (Boh.) and *eremita* Zach. were also drawn from the specimens in order to be able to compare the structure of the genitalia in species (Fig. 2) and detailed distribution data of these species were given. The author's name is abbreviated as A.K. while giving the examined material of the species. The other collectors are given in full name.

The type material of new described species are deposited in the collection of the author, in Regional Plants Protection Institute, Kalaba-Ankara.

Zyginidia (Zyginidia) artvinicus sp.n. (Fig.3 A-D)

Total length of ♂ 2.75-(2.90)-3.00 mm, ♀ 2.90-(3.05)-3.15 mm.

General apperance resembles to that of *Zyginidia (Zyginidia) pullula* (Boh.). On face genae, lorae and median part of postclypeus are whitish-yellow in color. Postclypeus with about 6-7 transverse suture impressions bordered with light brown lines on both sides. Anteclypeus light brown in major part and whitish-yellow at the base. Postclypeal cicatrices narrowly bordered with golden-yellow and these surrounded externally with dark bands, extending over vertex. Dark bands form two oval brown spots near the median of vertex. Vertex clear and whitish-yellow besides the eyes and at posterior half. Pronotum whitish-yellow on antrior and posterior bands, discal part shodawed with light brown. Golden colored patches can be seen

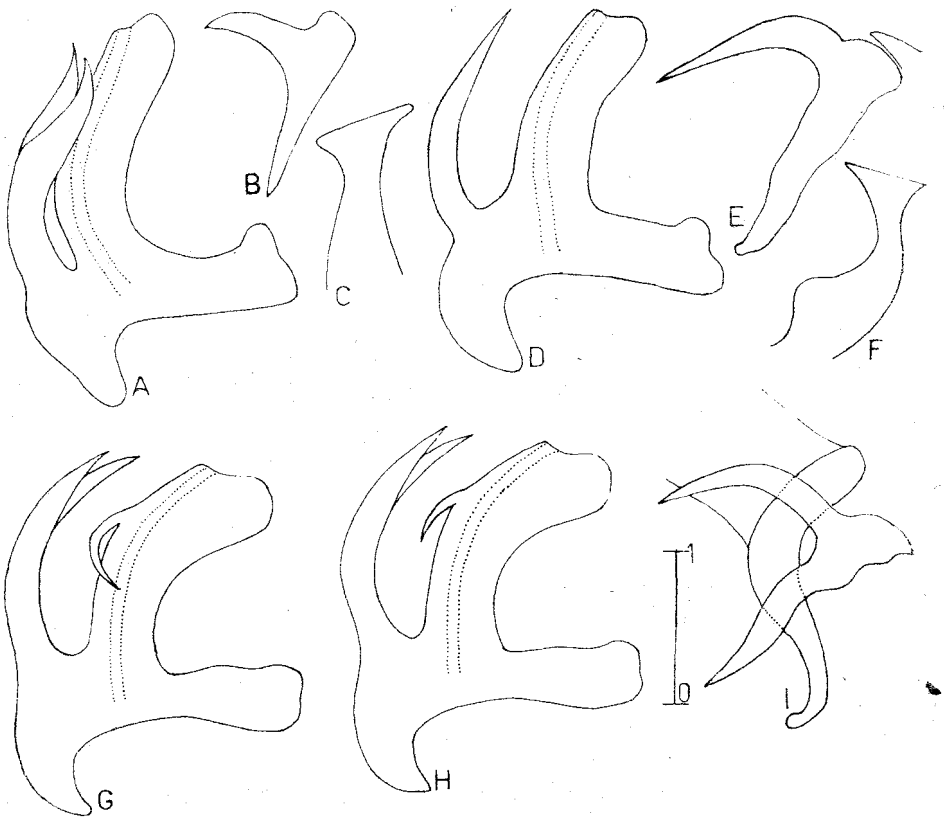


Fig. 2. A-C:**Z. (Z.) sohrab** Zach.: A-Aedeagus, B-Upper pygophore appendage, C-Apical part of Paramer, D-F: **Z. (Z) pullula** (Boh.): D-Aedeagus, E-Upper pygophore appendage, F-Apical part of Paramer.
G-I: **Z. (Z.) eremita** Zach.: G-Aedeagus with long aedeagal spines, H-Aedeagus with short aedeagal spines, I-Upper pygophore appendage with the anal tupe appendage

behind the eyes. Often pronotum has two oblong small, brown spots, placed in front of discal part near the median. Scutellum has black triangle spots in basal and posterior corners. Basal triangles away from the lateral margins. Posterior black spot extends to cicatrice in median part and lateral margins. Elytra light yellow and subhyaline. Inner margin of waxy area, cubital cell and claval veins slightly darkened. Legs clear and light yellow in color.

Male genital plates are as seen in Fig. 3 H, distal ends of plates are black and curved to dorsal. Paramers are in characteristical shape of *Zyginidia,* distal corners are sharply pointed (Fig. 3 C). Phallus distinguished from the other close species by having two pairs of spines arising on the

posterior face of the aedeagus. The distal pair rise just in front of gonopore, extending horizontally to posterior, coming out side at the base, and forming an acute angle between them while extending. They are as long as the lateral width of aedeagus at the apical or longer. Proximal pair of spine come out at the half length of the aedeagus, first directed ventral, then turn to lateral with a regular curvature. These spines are longer than the distal pair (Fig. 3 A,D). Anterior margin of aedeagus apically forms a slightly rounded lobe. Paired basal appendages rise away from the aedeagus on phallobase, lamellate, extending with a slight curve up to the level of distal spines of aedeagus, inclining to left and paralel to each other as in Fig.5 D. Upper pygophor appendages are well developed, both arms are long, especially the dorsal one longer than ventral arm. Dorsal arm makes almost a right angle near the base (Fig.3 B).

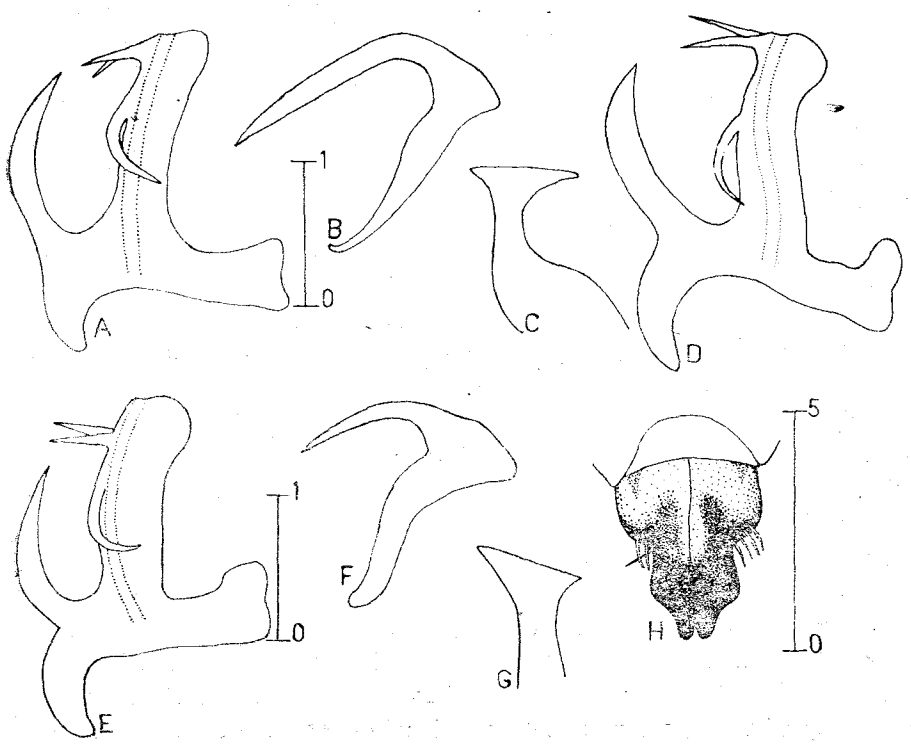


Fig. 3. A-D: Z. (Z.) artvinicus sp.n.-A-Aedeagus, B-Upper pygpohore appendage, C-Apical part of right paramer (of the specimen from Artvin: Ardanuç), D-Aedeagus (of the specimen from Artvin: Seedling Farm). E-H: Z. (Z.) karadenizicus sp.n.: E-Aedeagus, F-Upper pygophore appendage, G-Apical part of left Paramer, H-Male genital plates

Pregenital sternite of female posteriorly prolonged twice and median than sides, forming a narrowly rounded lobe in middle and laterally sinuated on posterior margin. Generally dark brown or black in color, having two light colored maculae near the base. Ovipositor is black. Ventral margin of pygophore with sparse, one row, long white macrosetae.

Distribution : Eastern Blacksea Coast Region.

Material examined : Artvin (Centrum: Seedling Farm) 30.8.1975 A.K. 1 Holotype ♂,1 Alotype ♀, Paratypes 17 ♂♂ 10 ♀♀, on vine *(Vitis vinifera)*. Other paratypes: Artvin (Ardanuç) 30.8.1975 A.K. 2 ♂♂ 4 ♀♀ on *Medicago sativa*. Rize 29.8.1975 H. Kıroğlu 2 ♂♂ 1 ♀, on *Ficus carica*.

Zyginidia (Zyginidia) karadenizicus sp.n. (Fig. 3E-H, 4 A-F).

Total length of ♂ 2.75-(2.81)-3.10 mm, ♀ 3.00-(3.033)-3.25 mm.

The external characters resemble to that of previously described species. Coloration on forebody is darker and more distinct (Fig. 4 A-E). In male elytra subcostal, radial externe apical cells are golden-yellow; waxy area and clavus lightly smoked; medial, cubital and other apical cells are transparent. In female, elytra are subhyaline; waxy area, clavus and veins are clear yellow colored.

General structure of genitalia as in *Z. (Z.) artvinicus* sp.n., but differs from it by the place of distal spines on aedeagus and the shape of upper pygopeoe appendage. As seen in Fig. 3 E, distal spines of aedeagus rise subapically on aedeagus, almost on the half way from the origin of proximal spines to gonopore. Distal spines as long as the lateral width of aedeagus at apical or shorter. Proximal pair of spines and paired basal appendages are like in *artvinicus* sp.n. In some specimens, aedeagal spines and basal appendages may show diversity in length. In some specimens only distal spines (Fig. 5 B), in some specimens proximal spines are shorter (Fig. 5 A), in some both distal and proximal spines are shorter than usual length (Fig. 5 C), sometimes they look like small denticles (Fig. 5 E). Basal appendages may be shorter than usual, extends as far as the origin of proximal spines of aedeagus (Fig. 5 A). Upper pygophore appendages look like to that of *pullula* (Boh.) (Fig. 3 F), dorsal arm thinner than ventral one and has a regular curvature at the basal part. Distal part of paramer is as seen in Fig. 3 G, extern margin not deeply excavated as in *artvinicus* sp.n.

Pregenital sternite of female posteriorly prolonged, but the median lob is truncated apically and it tightly surrounds the base of ovipositor (Fig.4 F).

Distribution : Blacksea Coast Region, east of Sinop.

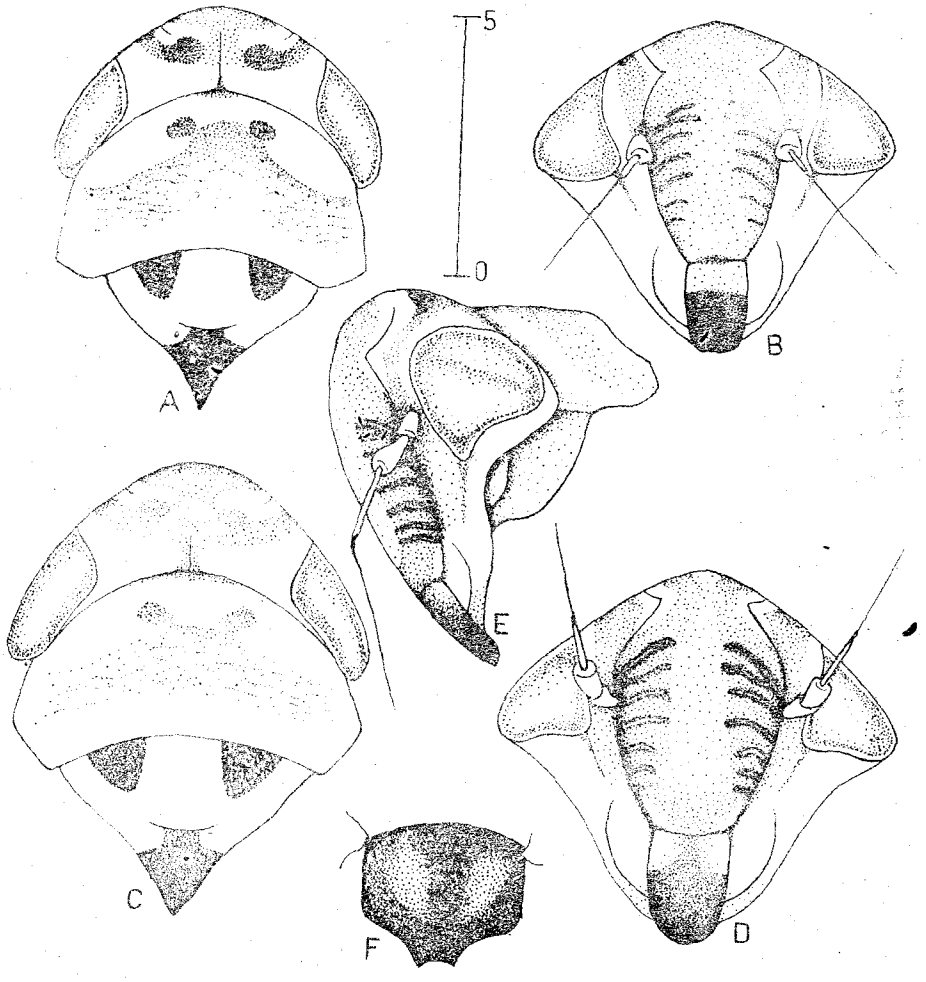


Fig. 4. Z. **(Z.) karadenizicus** sp.n.: A-B-Forebody and face of male, C-D-Forebody and face of female, E-Lateral view of forebody of female, F-Female pregenital sternite

Material examined : Samsun (Gelemen) 19.8.1975 A.K. 1 Holotype ♂, 1 Allotype ♀ , Paratypes: 4 ♂♂ 5 ♀♀, Other paratypes: Samsun (Gelemen) 14.7.1980 N. Özdemir 18 ♂♂ (1 ♂ as in Fig. 5B), 46 ♀♀ , on corn *(Zea mais)*. Samsun (Centrum) 1-15.7.1975 light trap, 30 ♂♂ (1 ♂ a in Fig.5 B and 3 ♂♂ as in Fig.5 C,D) 52 ♀♀ . Samsun (Bafra: Karaköy) 21.8.1975 A.K. 1 ♂ 1 ♀; O. Özatkan 4 ♂♂ (1 ♂ as in Fig.5 A. 1 ♂ as in Fig.5 B,1 ♂ as in Fig.5 C,D) 3 ♀♀ ; 23.8.1975 A.K. 3 ♀♀ , on rice *(Oryza sativa)*. Samsun (Bafra: Alaçam) 21.8.1975 O. Özatkan 1 ♀ ; 23.8.1975 A.K. and I. Çataloğlu 2 ♀♀ . Sinop (Ger-

ze) 23.8.1975 AK. 2 ♂♂ 4 ♀♀ , on *Thlapsi* sp. Sinop (Boyabat) 24.8.1975 A.K. ♂ (as in Fig.5 B) 2 ♀♀, on rice; I. Çataloğlu 1 ♂ 2 ♀♀, on corn. Sinop (Durağan) 24.8.1975 A.K. 4 ♂♂7 ♀♀ ; I. Çataloğlu 9 ♂♂ (6 ♂♂ as in Fig.5 B, 1 ♂ as in Fig.5 E) 12 ♀♀, on corn. Giresun 27.8.1975 A.K. 1 ♀. Trabzon 28.8.1975 A.K. 1 ♂ (as in Fig.5 B) 1 ♀ , on *Ficus carica*. Artvin Centrum: Seedling Farm) 30.8.1975. A.K. 6 ♂♂ 5 ♀♀ on vine. Artvin (Ardanuç) 30.8.1975 A.K. 1 ♂ on *Medicago sativa*.

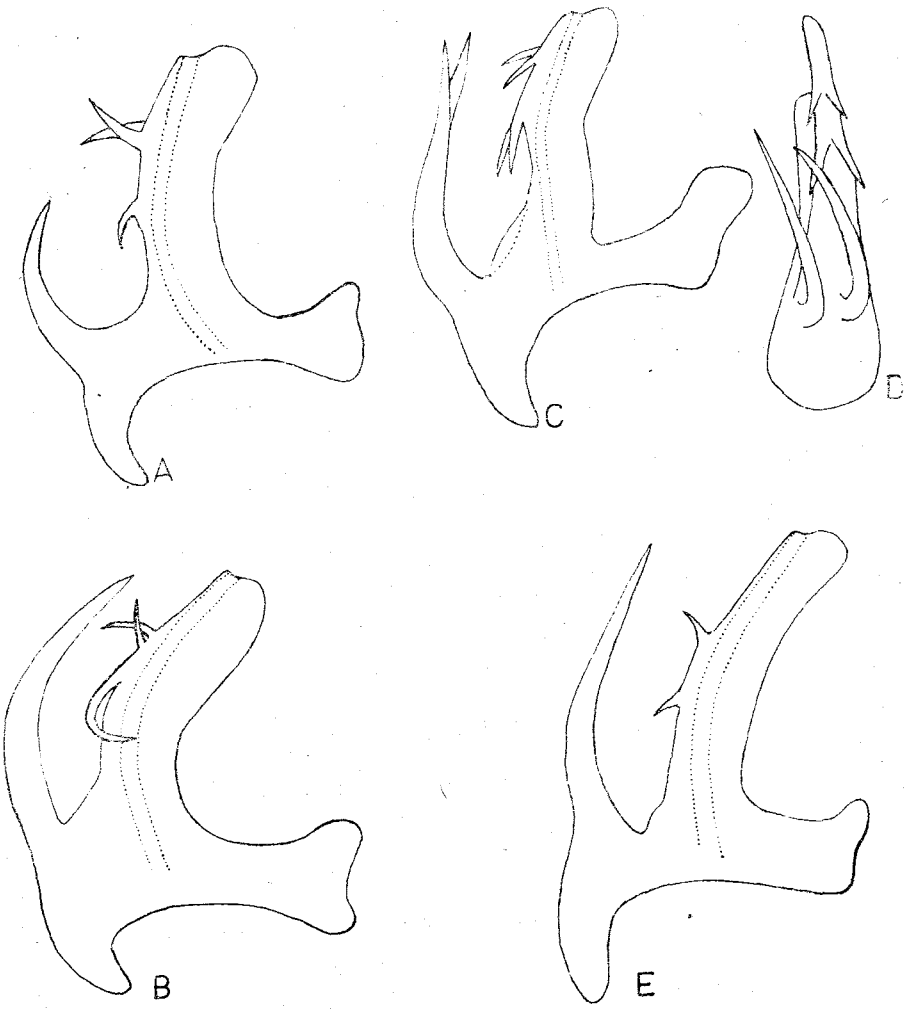


Fig.5. Variations in the aedeagus of **Z. (Z.) karadenizicus** sp.n. A-Aedeagus with short proximal aedeagal spines and basal appendages, B-Aedeagus with short distal aedeagal spines, C-Aedeagus having short distal and proximal aedeagal spines. D-Posterior view of same, E-Aedeagus with very short aedeagal spines

Zyginidia (Zyginidia) bafranicus sp.n. (Fig.6 A,B)

Total length of ♂ 2.75-(2.64)-2.95 mm, ♀ 3.025 mm

Dark pigmentation on forebody is not developed as well as other species. Pronotum is completely clear, anterior and posterior bands are whitish-yellow, and golden -yellow on discal part. Basal black triangles of scutellum are smaller, posterior black triangle not extends to cicatrice or, in case it does, it is narowly extended. Elytra hyaline, waxy area and veins are golden-yellow.

Aedeagal spines show very different pattern from the other two species. Both pairs of spines come out almost at the same level on half length of aedeagus on posterior face. Inner pair is short and curved dorsad. Outer pair rise a little dorsad of inner pair and directed to ventral, then laterally with a regular curvature like the proximal spines of other two species (Fig. 6 A). Basal appendages extend as far as the gonophore level. Both arms of upper pygophore appendages are almost at equal length, dorsal arm makes a large and regular curve (Fig.6 B).

In female, posterior median lobe of pregenital sternite is narrowly rounded.

Distribution: Central Blacksea Coast Region.

Material examined: Samsun (Bafra: Karaköy) 21.8.1975 O. Özatkan, 1 Holotype ♂,1 Allotype ♀ ,2 Paratype ♂♂ . Other Paratypes: Sinop (Kanlıçay) 23.8.1975 I. Çataloğlu 2 ♂♂ 1 ♀ on *Pteridium aquilinum*. Sinop (Durağan) 24.8.1975 I. Çataloğlu 4 ♂♂, on corn; A.K. 1 ♂ on rice. Samsun (Cent-

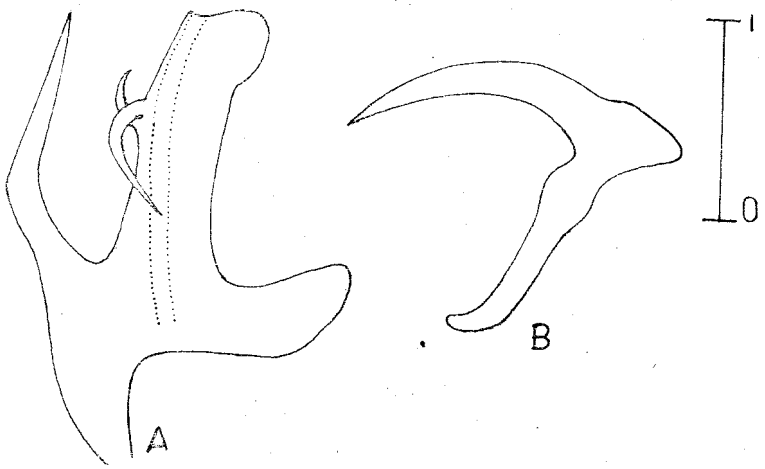


Fig. 6-A-B: Z. (Z.) **bafranicus** sp.n.: A-Aedeagus, B-Upper pygophore appendage

rum) 1-15.7.1975 light trap 1 ♂. Samsun (Gelemen) 14.7.1980 N. Özdemir 2 ♂♂ on corn.

Zyginidia (Zyginidia) emrea sp.n. (Fig.7 A-E)

Total length of ♂ 3.00 mm

In appearance and pigmentation, this species resembles to *karadenizicus* sp.n., as seen in Fig.7 E.

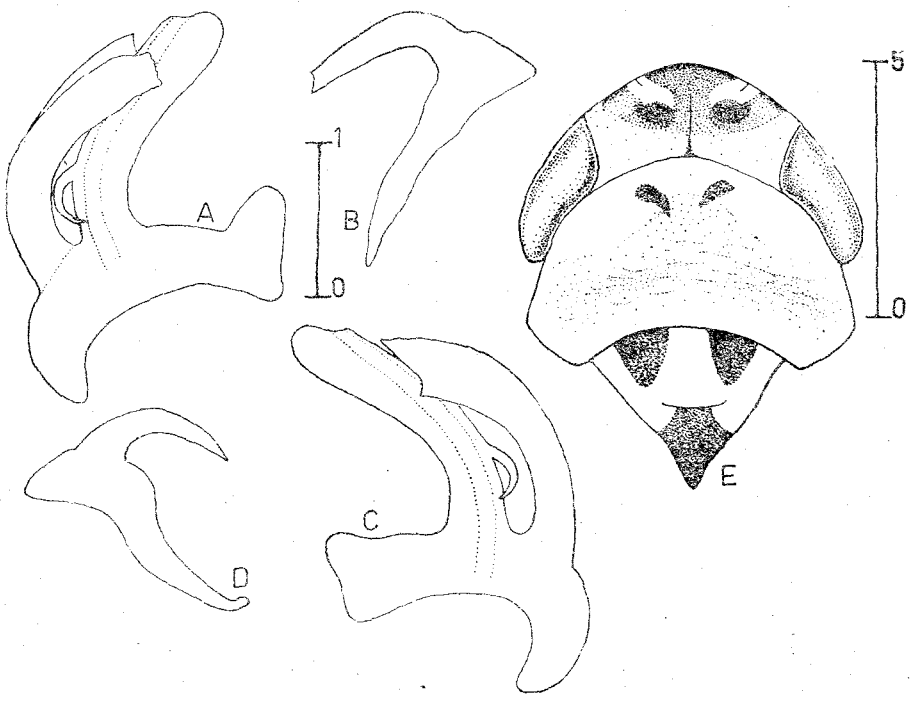


Fig. 7-A-E: Z. (Z.) **emrea** sp.n.: A-Aedeagus, from left side, B-Left upper pygophore appendage, C-Aedeagus from right side, D-Right upper pygophore appendage, E-Forebody

Genitalia, in general outline, resembles to that of *sohrab* Zach., but have some differences. The aedeagus is more slender than *sohrab* Zach. Basal appendages are more lamellate, especially at the distal half becomes larger and covers the posterior margin of aedeagus in lateral view (Fig.7 A,C). The apical parts of basal appendages were broken during preparation, therefore they appear to be different from each other, as seen figures. The upper pygophore appendages are like in *pullula* (Boh.) (Fig.7 B,D).

Female unknown.

Distribution: Northern Central Anatolia.

Material examined: Çankırı (Çatalelma) 21.6.1982 H. Memişoğlu, 1 Holotype ♂, on weeds around rice fields.

This species has been dedicated to my dear nephew Emre Cınkı.

Zyginidia (Zyginidia) eremita Zachvatkin, 1953

During the examination of the genitalia of the material, it is noticed that the length of the aedeagal spines showed diversity. In some specimens aeedegal spines are long and curved laterally with a regular curvature as figured by Dworakowska (1970) and as seen in Fig. 2G. In some specimens, they are in medium length, shorter than previous specimens, as in Fig.2 H, curve a little, but could not extend laterally. In some specimens, they are very short and look like small dents on the posterior face of aedeagus.

Material examined: Sinop (Durağan) 24.8.1975 I. Çataloğlu 14 ♂♂ (8♂♂ has long and 6♂♂ has very short aedeagal spines) 21 ♀♀ ; A.K. 1 ♂(with very short spine) 1 ♀,on corn. Sinop (Boyabat) 24.8.1975 A.K. 5 ♂♂ (with very short spines) 4 ♀♀ on rice. Sinop (Ahmetyeri) 24.8.1975 A.K. 3♂♂ (with very short spines) on sugarbeet. Samsun (Alaçam) 23.8.1975 A.K. 3 ♂♂ (with medium length spines) 1 ♀ ; I. Çataloğlu 3 ♀♀, on rice. Samsun (Gelemen) 19.8.1975 A.K. 1 ♂ (with medium length spines). Samsun (Centrum) 1-15.7.1975 light trap 4 ♂♂(with medium length spines).

Zyginidia (Zyginidia) pullula (Boheman, 1845)

Material examined: Amasya (Central province) 15.10.1974 F. Önder 1 spec., Ankara (Çubuk, 5.9.1967 A.K. 12 spec., 17.9.1968 A.K. 9 spec., Ankara (Çubuk-Karagöl) 20.8.1963, A.K.1 spec., Ankara (Elmadağ) 5.9.1967 A.K. 88 spec., on tomato, 30 spec., on pepper and 6 spec., on weeds. Ankara (Kayaş) 5.7.1967 A.K. 1 spec.; 6.9.1967 A.K. 13 spec.; 16.8,1967 A,K, 18 spec,; on weeds. Ankara (Hasanoğlan) 6.9.1967 A.K. 1 spec. Bolu (Düzce) 12.9.1983 H. Memişoğlu 6 spec., on rice, Bolu (Kıbrıscık) 6.7.1983 K. Melan 5 spec., on rice. Bolu (Seben) 8.7.1983 M. Özkan 23 spec., on rice. Çankırı (Ilgaz) 22.6.1932 M. Özkan 7 spec., on rice; 21.9.1982 H. Memişoğlu 2 spec., on rice. Çankırı (Konak) 23.6.1932 M. Özkan 2 spec., on weeds; 21.9.1982 H. Memişoğlu 9 spec., on rice. Çorum (Osmancık) 3.10.1974 F. Önder 1 spec. Kayseri (Yeşilhisar) 14.8.1979 F. Önder 1 spec., Nevşehir (Avanos) 10-18.8.1969 light trap. 3 spec., Nevşehir (Ürgüp) 2.10.1969 A.K. 1 spec. Nevşehir (Çat) 1-13.9.1969 light trap 1 spec., Nevşehir (Nar) 4.10.1969 A.K. 1 spec., Sinop (Boyabat) 2.10.1974 F. Önder 1 spec., Sinop (Durağan) 24.8.1975 A.K. 4 spec. on corn; I. Çataloğlu 7 spec. on corn.

Zyginidia (Zyginidia) sohrab Zachvatkin, 1947

Material examined: Adıyaman (Besni) 7.9.1979 Z. Şimşek 1 spec. on corn. Adıyaman (Gerger) 4.8.1980 Z. Şimşek 4 spec. on corn. Bingöl (Genç) 30.7.1980 Z. Şimşek 2 spec. on corn. Bitlis (Kermete) 22.9.1980 Z. Şimşek 4 spec. on millet. Diyarbakır (Central province) 7.6-16.7.1977 light trap 8 spec., Diyarbakır (Çüngüş) 18.7.1980, 26.9.1982 Z. Şimşek 768 spec. on corn. Diyarbakır (Ergani) 26.6.1980 Z. Şimşek 3 spec. on millet. Elâzığ (Sivrice) 4.7.1980 Z. Şimşek 4 spec. on corn. Gaziantep (Nurgana) 11.6.1969 A.K. 10 spec. on *Hibiscus esculentus*. Hakkari 15.6.1976 light trap 1 spec., Kars (Iğdır) 13.7.1970 A.K. 13 spec. on *Medicago sativa;* 9.7.1980 S. Uzunali 36 spec. on cotton. Malatya (Akçadağ) 3.7.1980 Z. Şimşek 8 spec. on corn. Malatya (Central province) 4.7.1980 Z. Şimşek 10 spec. on corn. Malatya (Pötürge) 16.9.1980 Z. Şimşek 365 spec. on corn. Siirt (Şirvan) 10.7.1980 Z. Şimşek 10 spec. on millet. Urfa (Birecik) 5.6.1980 Z. Şimşek 13 spec. on corn. Urfa (Ceylanpınar) 4.6.1969 A.K. 5 spec. on pepper. Van (Elmalı) 17.7.1970 A.K. 5 spec. on grass.

Özet

Zyginidia (Zyginidia) Haupt cinsinin dört yeni türü ve bu cinsin Türkiye'de bulunan türleri üzerinde taksonomik notlar ve yayılışları

Bu çalışmada Bolu-Ankara-Nevşehir-Gaziantep hattının doğusunda kalan bölgelerden toplanan **Zyginidia (S. Str.)** materyali taksonomik olarak incelendi. Bütün materyalin incelenmesi sonunda **Z. (Z.) sohrab** Zach. türü Doğu ve Güneydoğu bölgelerinde, **Z. (Z.) pullula** (Boh.) ise Orta Anadolu ve Batı Karadeniz Bölgelerinde hakim türler olarak tesbit edildi. Doğu Karadeniz Bölgesinde toplanan materyalde ise diğer bölgelerden tesbit edilmeyen **Z. (Z.) eremita** Zach. ve üç yeni tür saptanarak **Z. (Z.) artvinicus** sp.n., **Z. (Z.) karadenizicus** sp.n. ve **Z. (Z.) bafranicus** sp.n. isimleri ile tarif edilmişlerdir. Çankırı'dan toplanan bir numunede **Z. (Z.) emrea** sp.n. ismi ile aynı tür olarak tarif edilmiştir. Türlerin Türkiye'deki yayılış alanları haritada gösterilmiştir.

Acknowledgements

I would like to express my thanks to Dr. J. Dlabola of the National Museum (Natural History) in Prague Czechoslowakia, for his recommendations on these species. I also thank to my colleagues who send the material for my study.

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