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## ZOOGEOGRAPHIC AND ECOLOGICAL RELATIONS BETWEEN THE PLANTHOPPER-FAUNA OF GREECE AND ADJACENT COUNTRIES (HOMOPTERA, DELPHACIDAE)

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**Abstract:** The known planthopper species of Greece, Albania, Yugoslavia, Bulgaria, Turkey, Cyprus and Italy are listed. The geographic distribution of each species is based on all scientific information available until now. According to this material, the zoogeographic position of each country is analyzed and compared to the adjacent countries.

The delphacid species reported by NAST (1972) from Greece and adjacent countries were 120, including (15) species of uncertain generic position. The species were distributed over each country as follows: 5(2) in Greece, 12(1) in Albania, 52(2) in Yugoslavia, 24(1) in Bulgaria, 17 in Turkey, 17(2) in Cyprus and 83(12) in Italy. Obviously Italy was the richest country in species, while the number of species in the other countries, especially in Greece, was very small. Since that time several entomologists, especially Hemipterologists started to investigate these countries. All reports even some of them in press or preparation (see bibliography) contributed in forming the present list (Table 1). In this list are included all species reported until now for each country and consequently for the north-eastern Mediterranean region.

The zoogeographic definition of each species is based on recently published reports and on many personal communications I had with Prof. R. Remane and M. Asche from Marburg University, W. Germany. Consequently, there is an enormous change comparing the zoogeographic data of this list and those of SERVADEI (1967) and NAST (1972). Thus, many species of uncertain generic position distributed mainly in the Mediterranean region, now belong to certain genera and others are synonyms of already known species. Concerning geographic distribution there is also a better understanding of the southern distribution of many European or Eurosiberian species and of course for the little known Mediterranean species. However, among the 160 species presented in this list (Table 1) there are 18 species which are either of uncertain generic and in general systematic position or their status is questionable. These species, indicated in this list with a question mark, are not considered in further zoogeographic analysis. In this list are included 3 species (*Hyledelphax elegantulus* (Bh.), *Javesella discolor* (Bh.) and *Criomorpha albomarginatus* Curt.) new to the Bulgarian fauna, from material sent to the author by Dr. B.

Table 1. List of the planthopper species and the known distribution of each species occurring in Greece (GR), Albania (AL.), Yugoslavia (YUG.), Bulgaria (BUL.), Turkey (TUR.), Cyprus (CYP.) and Italy (IT)

	GR.	AL.	YUG.	BUL.	TUR.	CYP.	IT.	
<i>Asiraca clavicornis</i> (F.)	+	+	+	+	+	+	+	Eurosib.-Medit.
<i>Kelisia brucki</i> Fb.	+	+	+	+	+	+	+	Pontomedit
<i>K. confusa</i> Lv.	+	-	+	+	-	-	+	Euromedit.
<i>K. cretica</i> Asche	+	-	-	-	-	-	-	Endemic
<i>K. guttula</i> (Gm.)	+	+	+	-	-	-	+	Eurosib.
<i>K. gargano</i> Rm. et Asche	+	-	+?	-	-	-	+	Holomedit.
<i>K. guttulifera</i> (Kbm.)	+	-	+	-	-	-	-	European
<i>K. haupti</i> Wgn.	+	-	-	-	-	-	-	European
<i>K. henshii</i> Hv.	+	-	+	-	-	-	-	European
<i>K. melanops</i> Fb.	+	-	+	-	+	-	+	Euromedit.
<i>K. monoceros</i> Rib.	+	-	+	-	-	-	+	European
<i>K. pallidula</i> (Bh.)	-	-	+	-	-	-	-	Eurosib.
<i>K. perrieri</i> Rib.	+	-	-	-	-	+?	+	W.C.Medit.
<i>K. praecox</i> Hpt.	+	-	+	+	-	-	-	Eurosib.
<i>K. punctulum</i> (Kbm.)	-	-	+	-	-	-	-	European
<i>K. ribauti</i> Wgn.	+	-	+	+	+	+	-	Eurosib.
<i>K. sulcata</i> Rib.	-	-	-	-	-	-	+	W.Medit.
<i>K. vittipennis</i> (J.Sb.)	+	-	+	-	-	-	+	Eurosib.
<i>K. yarkonensis</i> Lv.	+	-	+	-	+	-	-	E.Medit.
<i>Anakelisia fasciata</i> (Kbm.)	+	-	+	-	-	-	-	European
<i>A. perspicillata</i> (Bh.)	+	-	+	-	-	-	+	Eurosib.
<i>Stenokelisia angusta</i> Rib.	-	-	+	-	-	-	-	European?
<i>Stenocranus fuscovittatus</i> (Stal)	+	-	+	+	-	-	+	Eurosib.
<i>S. major</i> (Kbm.)	-	-	+	-	-	-	+	European
<i>S. minutus</i> (F.)	+	-	+	+	+	-	+	Euromedit.
<i>Jassidaeus lugubris</i> (Sgn.)	+	-	-	-	-	-	-	European
<i>Delphacinus mesomelas</i> (Bh.)	-	-	-	-	-	-	+	European
? <i>Delphacellus putoni</i> (Sc.)	-	-	-	-	-	-	+	W.Medit.
<i>Ditropis pteridis</i> (Spin.)	+	+	+	+	+	+	+	European
<i>Eurya brunnea</i> Mel.	+	-	-	-	-	-	-	European
<i>E. douglasi</i> (Sc.)	+	-	-	-	-	-	-	European
<i>E. flavobrunnea</i> Dlab.	+	-	+	-	-	-	+	Medit.
? <i>E. immunda</i> Hv.	-	+	+	-	-	-	+	Medit.
<i>E. lineata</i> (Pr.)	+	-	+	+	+	-	+	Euromedit.
<i>E. rubripes</i> (Mts.)	+	-	-	-	-	-	+	Medit.
<i>Remanodelphax cedroni</i> Dros.	+	-	-	-	-	-	-	Endemic
<i>Stromeurysa vitoshaensis</i> Dlab.	-	-	-	+	-	-	-	Endemic
<i>Eurysula lurida</i> (Fb.)	-	-	+	-	-	-	+	Eurosib.
<i>Eurybregma bielawskii</i> Nast	+	-	-	+	-	-	-	Pontomedit.
? <i>E. dlabolai</i> Kalk.	-	-	-	-	-	+	-	Endemic
<i>E. nigrolineata</i> Sc.	+	-	+	-	+	-	-	Eurosib.
<i>Stiroma affinis</i> Fb.	+	-	+	-	-	-	+	Eurosib.
<i>S. bicarinata</i> (H.-S.)	+	-	+	+	-	-	+	Eurosib.
<i>Metropis inermis</i> Wgn.	+	-	-	-	-	-	+	Eurosib.

Table I suite

	GR.	AL.	YUG.	BUL.	TUR.	CYP.	IT.	
<i>M. latifrons</i> (Kbm.)	-	-	-	-	-	-	+	European
<i>M. latinus</i> Lv.	-	-	-	-	-	-	+	Endemic
<i>M. maurus</i> Fb.	-	-	-	-	-	-	+	European
<i>M. mayri</i> Fb.	+	-	+	-	-	-	+	European
<i>Tropidocephala andropogonis</i> Hv.	+	-	+	+	+	-	-	European
<i>T. tuberipennis</i> (Ms. et Rey)	+	+	-	-	+	+	+	Holomedit.
<i>Achorotile albosignata</i> (Db.)	-	-	+	-	-	-	+	Eurosib.
<i>Euconomelus lepidus</i> (Bh.)	+	-	+	+	-	-	+	Eurosib.
<i>Conomelus lorifer</i> Rib.:								
<i>C.l. calabricus</i> (Dlab.)	-	-	-	-	-	-	+	Endemic
<i>C.l. dehneli</i> (Nast)	-	-	+	+	-	-	+	European
<i>C.l. lorifer</i> Rib.	-	-	-	-	-	-	+	European
<i>C. odryssi</i> (Dlab.)	+	-	+	+	+	-	-	Pontomedit.
<i>C. sagittifer</i> Rm. et Asche	+	-	-	-	-	-	+	C.Medit.
<i>Delphax armeniacus</i> An.	+	-	-	-	-	-	-	Pontomedit.
<i>D. crassicornis</i> (Pz.)	+	-	+	-	+	-	+	Eurosib.-Medit.
<i>D. inermis</i> Rib.	+	-	-	-	-	+	+	Holomedit.
<i>D. meridionalis</i> (Hpt.)	+	-	-	-	-	-	-	Endemic
<i>D. pulchellus</i> (Ct.)	-	-	+	+	-	-	+	European
<i>D. ribautianus</i> Asche et Dros.	+	-	+?	-	-	-	+	Medit.
? <i>Euides basilinea</i> (Gm.)	-	-	-	-	-	-	+	European
<i>E. caspiana</i> (Dlab.)	-	-	-	-	+	-	-	Pontomedit.
<i>E. speciosa</i> (Bh.)	+	-	+	-	-	-	+	Eurosib.
<i>Chloriona clavata</i> Dlab.	+	-	+	-	+	-	-	Pontomedit.
<i>C. flaveola</i> Lb.	+	-	-	+	+	+	+	Holomedit.
<i>C. glaucescens</i> Fb.	+	-	+	-	-	-	+	European
<i>C. ponticana</i> Asche	+	-	-	-	+	-	-	E.Medit.
? <i>C. sicula</i> Mts.	-	-	-	-	-	-	+	Endemic
<i>C. smaragdula</i> (Stal)	-	-	+	-	-	-	+	Eurosib.
<i>C. unicolor</i> (H.-S.)	+	-	-	-	+	-	+	Eurosib.-Medit.
<i>C. vasconica</i> Rib.	+	-	+	-	-	-	+	European
<i>Cantoreanus olorus</i> Dlab.	-	-	+	+	-	-	-	E.European
? <i>Megamelus discrepans</i> Hpt.	-	-	-	-	-	-	+	Endemic
? <i>M. leptus</i> Fb.	-	-	-	-	-	-	+	European
<i>M. notula</i> (Gm.)	+	-	+	-	-	-	+	Holarctic?
<i>Kakuna velitskouskyi</i> (Mel.)	-	-	-	+	-	-	-	Pontosib.
<i>Unkanodes latespinosa</i> (Dlab.)	-	-	+	-	+	-	-	Pontosib.
<i>U. tanasijeveci</i> (Dlab.)	-	-	+	-	+	-	-	Pontomedit.
? <i>Megadelphax sordidulus</i> (Stal)	-	-	+	-	+	-	+	Eurosib.
<i>Laodelphax striatellus</i> (Fn.)	+	+	+	+	+	-	+	Holarctic
<i>Leptodelphax cyclops</i> Hpt.	-	-	-	-	-	+	+	E.Medit.
<i>Litochodelphax aliakmon</i> Asche	+	-	-	-	-	-	-	Endemic
<i>Sogatella furcifera</i> (Hv.)	-	-	+?	-	-	-	+	SE. Medit.-Oriental
? <i>S. matsumurana</i> (Metc.)	-	-	-	-	-	-	+	Medit.
<i>S. vibix</i> (Hpt.)	+	-	+	-	+	+	-	SE. Medit.-Ethiopian

Table I suite

	GR.	AL.	YUG.	BUL.	TUR.	CYP.	IT.	
Ditropsis flavipes (Sgn.)	-	-	+	-	+	-	+	Eurosib.
Paraliburnia adela (Fl.)	+	-	-	-	-	-	-	Eurosib.
Hyledelphax elegantulus (Bh.)	+	-	+	+	-	-	+	Eurosib.
Megamelodes quadrimaculatus (Sgn.)	+	-	+	+	-	-	+	European
M. lequesnei Wg.	-	-	+	-	-	-	-	European
Calligypona reyi (Fb.)	+	-	+	+	-	-	+	Eurosib.
Delphacodes albifrons (Fb.)	-	-	+	+	-	-	-	European
D. audrasi Rib.	+	+	+	+	+	-	-	Pontomedit.
D. capnodes (Sc.)	+	-	+	+	-	-	-	European
D. venosus (Gm.)	+	+	+	+	-	-	+	Eurosib.
Gravesteiniella boldi (Sc.)	-	-	+	-	-	+	-	Eurosib.
Muellerianella brevipennis (Bh.)	+	-	+	-	-	-	+	Eurosib.
M. extrusa (Fl.)	+	-	+	-	-	-	-	European
M. fairmairei (Pr.)	+	-	+	+	-	-	+	European
Chlorionidea flava Low.	+	-	+	-	-	-	+	C. European?
Muirodelphax aubei (Pr.)	+	-	+	+	+	-	+	Eurosib.-Medit.
Acanthodelphax spinosus (Fb.)	+	-	+	+	+	-	+	European
A. denticauda (Bh.)	+	-	-	-	-	-	-	European
Halmyra aeluropodis (Emel.)	+	-	-	-	-	-	-	Pontomedit.
Dicranotropis beckeri Fb.	+	-	-	-	+	-	-	Pontomedit.
?D. dimorpha Mts.	-	-	-	-	-	-	+	Endemic
D. divergens Kbm.	+	+	+	+	-	-	+	European
D. hamata (Bh.)	+	-	+	+	+	-	+	Eurosib.
Florodelphax leptosoma (Fl.)	+	-	+	+	+	-	+	Eurosib.
F. mourikisi Dros.	+	-	-	-	-	-	-	Endemic
F. paryphasma (Fl.)	-	-	+	-	-	-	-	European
Kosswigianella exigua (Bh.)	-	-	+	-	-	-	+	Eurosib.
Strubingianella lugubrina (Bh.)	-	-	+	-	-	-	+	Eurosib.
Horvathianella palliceus (Hv.)	+	-	+	+	+	-	+	European
Xanthodelphax flaveolus (Fl.)	+	-	+	-	-	-	+	Eurosib.
X. hellas Asche	+	-	-	-	-	-	-	Endemic
X. stramineus (Stal)	-	-	+	-	-	-	+	Eurosib.
Paradelphacodes paludosa (Fl.)	-	-	+	+	-	-	+	European
Oncodelphax pullulus (Bh.)	-	-	+	-	-	-	-	European
Criomorpus albomarginatus Curt.	+	-	+	+	-	-	-	European
Pseudodelphacodes flaviceps (Fb.)	-	-	+	-	-	-	-	C.European?
Falcotoya minuscula (Hv.)	+	-	+	+	+	-	-	Medit.
Toya ibiturca Asche	+	-	-	-	+	-	-	Medit.
T. hispijmena Asche	+	-	-	-	-	-	+	Medit.
T. obtusangula (Lv.)	+	-	-	-	+	+	+	Holomedit.
T. propinqua (Fb.)	+	+	+	+	+	+	+	Holarctic
Javesella discolor (Bh.)	+	-	+	+	-	-	+	Eurosib.
J. dubia (Kbm.)	+	-	+	+	+	+	+	Euromedit.
J. forcipata (Bh.)	+	-	+	-	-	-	+	Eurosib.
J. obscurella (Bh.)	+	-	+	+	+	-	+	Eurosib.-Nearctic?

Table I suite

	GR.	AL.	YUG.	BUL.	TUR.	CYP.	IT.	
J. pellucida (F.)	+	-	+	-	+	-	+	Eurosib?
J. salina (Hpt.)	-	-	-	-	+	-	-	European
J. stali (Metc.)	-	-	-	-	-	-	+	C.European?
Ribautodelphax albostratus (Fb.)	+	-	+	+	-	+	+	Eurosib.
R. collinus (Bh.)	+	-	+	+	+	-	+	Eurosib.
R. imitans (Rib.)	+	-	-	-	-	-	+	European
R. pungens (Rib.)	+	-	+	-	-	-	+	European
R. pallens (Stal)	+	-	+	-	-	-	-	European
?Pseudaraeopus dalmatinus Hv.	-	-	+	-	-	-	-	Endemic
P. lethierryi (Ms. et Rey)	+	-	+	-	+	+	+	Medit.
Euidopsis truncata Rib.	+	-	-	-	+	+	+	Medit.-Afric.
Alatades trilineus Dlab.	+	-	-	-	+	-	-	E.Medit. Afric.
Perkinsiella dorsata (Mel.)	-	-	-	-	+	+	-	SE. Medit.-Ethio
P. rivularis Lv.	+	-	-	-	-	-	-	SE. Medit.-Ethio
Agriscula ankistrofer Asche	-	-	-	-	-	-	+	Endemic
Matutinus putoni (Costa)	+	-	-	-	+	-	-	Medit.-Afric.
Flastena fumipennis (Fb.)	+	-	+	+	+	+	-	Medit.
?Iubsoda duffelsi Dlab.	-	-	-	-	-	-	+	Medit.
I. stigmatica (Mel.)	+	-	+	-	+	-	+	Medit.
?Liburnia coracina Csiki	-	+	+	-	-	-	-	European
?L. lethierryi Sc.	-	-	-	-	-	-	+	Medit.
?L. latifrons Fb.	-	-	-	-	-	-	+	European
?Delphax macroptera O.Costa	-	-	-	-	-	-	+	Endemic
?D. radiata O.Costa	-	-	-	-	-	-	+	Endemic
?D. tapina Fb.	-	-	-	-	-	-	+	European
?D. uncinata Fb.	+	-	-	-	-	-	-	European
Maculidelphax maculipennis Lv.	+	-	-	-	-	-	-	E.Medit.
Total: 160	103	12	98	45	50	20	98	(species)
67	48	9	51	33	35	16	45	(genera)

Gruev from Plovdiv. Preliminarily also should be mentioned that 10 additional species have been collected in Greece, thus the actual number of delphacid species occurring, so far, in Greece is 112. Eight species are probably new species.

From all data presented so far, we may see what zoogeographic element occurs, in each of these countries as well as in the whole area consisting of them (Table 2). It is clear that in the whole area the European-Eurosiberian element is dominating the Mediterranean in a proportion of number of species 82:47. Undoubtedly, this proportion is due to the fact that in countries which are not in vicinity with Central Europe (Greece, Albania, Turkey and partly

Table 2. Geographic distribution of the delphacid species in East Mediterranean

(H.M.: Holomediterranean, E.M.: East Mediterranean, C.M.: Central Mediterranean, M: Mediterranean, M.E.: Mediterranean-Ethiopian, M.O.: Mediterranean-oriental, M.A.: Mediterranean-African, P.M.: Pontomediterranean, E.M.: Eyromediterranean, S.M.: Eurosiberian-Mediterranean, Σ.M.: Total Mediterranean, E.: European, S.: Eurosiberian, P.S.: Pontosiberian, Σ E.S.: Total European, Euro-Pontosiberian, H.: Holarctic and E.W Endemic).

	No spp.	No(%)										No(%)						
		H.M.	M.C.	M.	M.E.	M.O.	M.A.	P.M.	E.M.	S.M.	Σ.M.	E.	S.	P.S.	Σ.E.S.	H.	E.	
GREECE	102	5	3	2	9	2	—	3	8	5	4	41(40)	26	26	—	52(51)	3	6
ALBANIA	10	1	—	—	—	—	—	—	2	—	1	4(40)	2	2	—	4(40)	2	—
YUGOSLAVIA	95	2	1	—	6	1	1	—	5	5	4	25(26)	32	34	1	67(70)	3	—
BULGARIA	45	1	—	—	2	—	—	—	4	4	2	13(29)	14	14	1	29(64)	2	1
TURKEY	49	4	3	—	5	2	—	3	7	4	4	32(65)	5	9	1	15(31)	2	—
CYPRUS	19	4	1	1	2	2	—	1	1	1	1	14(74)	1	3	—	4(21)	1	—
ITALY	85	5	—	3	6	—	1	1	1	5	4	26(31)	22	31	—	53(62)	3	3
Total	142	5	4	3	9	3	1	3	10	5	4	47(33)	44	36	2	82(58)	3	10

Bulgaria) exist localities or areas which are similar climatologically and floristically to those of central or even northern Europe (e.g. Rodopi mountain range in Greece). Despite the fact that the countries Albania, Cyprus, Turkey and Bulgaria are badly till insufficiently investigated, there still is a reliable relation between the geographic position and zoogeographic character of each country. For example, quantitatively, the fauna of Cyprus is more Mediterranean and less European-Eurosiberian than that of Yugoslavia where the European - Eurosiberian element dominates the Mediterranean one (Table 2).

Since planthoppers are long migrating insects they have a large geographic distribution. This contributes in smaller faunistic differences between adjacent countries than between none-adjacent ones. Thus, as shown in Table 3, the number of common species of Greece and Turkey is larger than that between of Italy and Turkey. In Table 3 are also presented the comparisons of each country to all the others in all combinations possible. Unfortunately, because the planthopper fauna of Albania, Bulgaria, Turkey and Cyprus are insufficiently known, a reliable comparison can be made at present only between the planthopper fauna of Greece, Yugoslavia and Italy. Indeed, among the 142 species occurring in the 7 countries 136 occur in these three good investigated countries! The 6 remaining species are: *Stiromeurysa vitoshaensis* Dlab., endemic to Bulgaria, *Euides caspiana* (Dlab.), Pontomediterranean reported from Turkey, *Kakuna velitskouskyi* (Mel.) Pontosiberian reported from Turkey and Cyprus, *Javesella salina* (Hpt.) European and doubtfully recorded from Turkey, *Leptodelphax cyclops* Hpt. East Mediterranean reported from Turkey and Cyprus and *Perkinsiella dorsata* (Mel.), s.e. Mediterranean-Ethiopian, reported also from Turkey and Cyprus. However, only 53 species out of 136

Table 3. Comparison between the number of planthopper species of Greece (GR.), Albania (AL.), Yugoslavia (YUG.), Bulgaria (BUL.), Turkey (TUR.), Cyprus (CYP.) and Italy (IT.). A. indicates the total number of species occurring in two countries. B. indicates the number of common species, C. the number of species not occurring in the later country and D. the number of species not occurring in the former country.

	GR.-AL.	GR.-YUG.	GR.-BUL.	GR.-TUR.	GR.-CYP.	GR.-IT.
A.	102	127	109	110	105	124
B.	10	70	38	41	16	63
C.	92	32	64	61	86	39
D.	—	25	7	8	3	22

  

	AL.-YUG.	AL.-BUL.	AL.-TUR.	AL.-CYP.	AL.-IT.
A.	95	47	52	24	86
B.	10	8	7	5	9
C.	—	2	3	5	1
D.	85	37	42	14	76

  

	YUG.-BUL.	YUG.-TUR.	YUG.-CYP.	YUG.-IT.
A.	99	108	102	114
B.	41	36	12	66
C.	54	59	83	29
D.	4	13	7	19

  

	BUL.-TUR.	BUL.-CYP.	BUL.-IT.
A.	72	55	99
B.	22	9	31
C.	23	36	14
D.	27	10	54

  

	TUR.-CYP.	TUR.-IT.	CYP.-IT.
A.	52	105	A. 91
B.	16	29	B. 13
C.	33	20	C. 6
D.	3	56	D. 72

occurring in these countries are common. Comparison between each country with each of the other two and between the western part of the Balkan penin-

sula (that means Greece - Albania and Yugoslavia) and Italy is shown in Table 4. According to data presented in this table we may conclude the following:

1. The number of common species between the three pairs of countries is almost constant.

2. The zoogeographic differences are related to the geographic position of the countries. Thus, the Mediterranean element of Greece is larger than that of Yugoslavia and Italy. From the fact that there are considerable differences between the number of Mediterranean species of Yugoslavia and Italy we may conclude that besides the latitudinal distribution of the delphacid species there is also a longitudinal one. This conclusion is also supported when we consider

Table 4. Comparison between the number of planthopper species of Greece, Yugoslavia and Italy, with an analysis of the total Mediterranean (Medit) and total European, Euro and Ponto-siberian (Europ.) species. Symbols A,B,C and D the same as in Table 3 and material the same as in Tables 1,2 and 3.

GR. - YUG.				
A.	127			
B.	70	B.Medit. 23	C.Medit. 18	D.Medit. 2
C.	32	B.Europ. 44	C.Europ. 8	D.Europ. 23
D.	25			
GR. - IT.				
A.	124			
B.	63	B.Medit. 24	C.Medit. 17	D.Medit. 2
C.	39	B.Europ. 36	C.Europ. 16	D.Europ. 17
D.	22			
YUG. - IT.				
A.	114			
B.	66	B.Medit. 17	C.Medit. 8	D.Medit. 9
C.	29	B.Europ. 46	C.Europ. 21	D.Europ. 7
D.	19			
(GR. + YUG.) - IT.				
A.	136			
B.	76	B.Medit. 25	C.Medit. 18	D.Medit. 1
C.	51	B.Europ. 48	C.Europ. 27	D.Europ. 5
D.	9			

the European element. However, quantitatively the distribution of at least the European element is rather more pronounced latitudinally than longitudinally. Unfortunately, we know very little about the African planthopper fauna and its contribution to the Mediterranean fauna.

3. Comparing the western Balkan fauna with the Italian one we may see that the Balkan fauna is richer in species for both the European and the Mediterranean species. Thus, only one Mediterranean and five of the European Italian species do not occur in the w. Balkan region. Distributionally there is no significant difference between the Balkan and Italian fauna, taking into account the European and Mediterranean-elements ( $X^2 = 0.138$ ,  $P > 0.05$ ).

4. Obviously, there is no relation between the size of the countries and the number of species or genera occurring in them (Table 1). Therefore, we can not say that any of these countries is a centre of speciation for delphacids.

Finally, we may see that for a better zoogeographic analysis more work and data on the fauna of each country are needed. However, the data presented here for Greece, Yugoslavia and Italy are reliable thanks also to the great knowledge and cooperation of my colleagues M.Asche, R. Remane and J.Dlabola. In future, we hope to include for a better zoogeographic analysis of the Balkan regions more data also from other families of Auchenorrhyncha.

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### Discussion

- BERON: Have you found any delphacid species on the highest parts of the Greek mountains? How high do they reach?
- DROSOPOULOS: There are European or Eurosiberian species which occur only in more than 1500 m altitude. Also, there are other species which occur in altitudes ranging from sea

level until 2000 m. Personally I never collected at more than 2100 m altitude and until there I have found several species of delphacids.

**LEGAKIS:** Are there any patterns inside Greece in the distribution of the Delphacidae? Can any regions be differentiated?

**DROSOPOULOS:** Of course there are, but this subject is concerning zoogeographic analysis of the Greek planthopper fauna which will appear in another article.

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