

THE SCORPIONS OF LESVOS  
(ARACHNIDA, SCORPIONES)

By

D. VOULALAS and Dr. K. MICHALIS

(Department of Zoology, University of Thessaloniki)

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**Abstract:** *The object of this study were the scorpions of the island Lesvos. During systematic elaboration of the samples, we ascertained, that they belonged to two species: Mesobuthus gibbosus (Brullé, 1832) family Buthidae and Euscorpius carpathicus (Linnaeus, 1767) family Chaetidae.*

*From variability study of the tecth number on the pectens in males as well in females of Mesobuthus gibbosus has been found out that this variation is normal distributed to the samples.*

*Applying the  $X^2$  test on the above variation was proved that the samples of the northern and southern localities of the island are from the same population.*

*Finally with the  $X^2$  test it has been found out that there is a significant difference as to the number of trichobothria on the pedipalp tibia among in female individuals of Euscorpius carpathicus which are from two different localities of the island.*

## I. INTRODUCTION.

The island Lesvos is situated in the northeast Aegean Sea and has an area about of 1630 square kilometers.

The scorpionfauna of the island is not rich in species. Although we have done about 30 stations and collected a relatively large number of samples, their systematic study made it clear that the individuals belong to two species: *Mesobuthus gibbosus* (Brullé, 1832) family Buthidae, and *Euscorpius carpathicus* (Linnaeus, 1767) family Chaetidae.

The Greek scorpions have generally been studied at times by various scientists, like A. Birula (1903) Fr. Werner (1928) J. Gruber (1963), R. Kinzelbach (1975) and others.

The main characters that we used for the systematic classification

of our samples were the following: the form of the sternum, shape of the middle lamellae in the pectens, spurs on the legs, number of lateral eyes, subaculear tubercle, number of keels on the cauda segments, number and arrangement of trichobothria, arrangement of keels on the carapace and finally, number and arrangement of granules just proximal to terminal tooth of pedipalp tarsus.

## II. RESULTS

FAMILY: BUTHIDAE E. Simon, 1879

GENUS: *Mesobuthus* Vachon, 1950

### I. *Mesobuthus gibbosus* (Brullé, 1832)

#### a. Synonyms:

*Buthus gibbosus* Brullé: Fr. Werner, S. B. Ak. Wiss., Wien, 1928, 137:294,

*Buthus gibbosus* Brullé, 1832: J. Gruber, Ann. Nat. Mus. Wien, 1963, 66:307.

Kinzelbach (1975) refers, among the others, the following synonyms:

*Androctonus peloponnensis* C. L. Koch 1836: Arachn. 3:34.

*Androctonus stenelus* C. L. Koch 1841: Arachn. 8:23.

#### b. Ecology:

They inhabit mostly the semiarid coastal regions of the island with low vegetation (herbaceous and bushy) under stones, in crevices of the ground, under ruins of houses etc.

#### c. Distribution on the island:

Skala Eressou: (E) 10 July 1976, 3♀ and 2♂

Vatoussa: (V) 10 July 1976, 1♂

Vatera (Ag. Phokas): (Ph) 6 July 1976, 4♀ and 1♂

Polyhmitos: (O) 6 July 1976, 7♀.

Aphalonas: (W) 20 August 1976, 2♀ and 2♂.

Keramia: (R) 6 July 1976, 1♀.

Plomarion (Kournela): (K<sub>1</sub>) 5 July 1976, 1♀ and 2♂.

» » : (K<sub>2</sub>) 2 August 1976, 4♀ and 1♂.

Plomarion : (P<sub>1</sub>) 28 April 1976, 1♀.

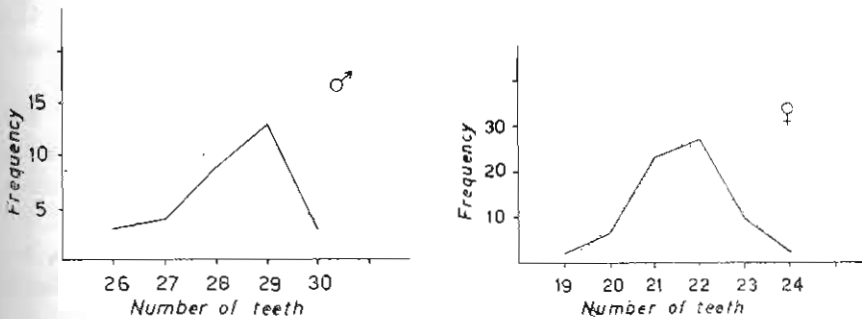
» : (P<sub>2</sub>) 5 July 1976, 3♀ and 1♂.

» : (P<sub>3</sub>) 25 July 1976, 3♀.

Arisvi	:	(A) 8 July 1976, 1♀ and 2♂.
Mithima	:	(M <sub>1</sub> ) 9 July 1976, 2♀ and 2♂.
»	:	(M <sub>2</sub> ) 9 July 1976, 2♀ and 1♂.
Mandamados	:	(T <sub>1</sub> ) 7 May 1975, 13♀ and 7♂.
»	:	(T <sub>2</sub> ) 20 July 1975, 15♀ and 7♂.
»	:	(T <sub>3</sub> ) 25 August 1975, 7♀ and 3♂.

*d. Biometric elements:*

d<sub>1</sub>) We noticed, that the number of teeth on the pectines is not constant among the various samples but ranges from 19 to 24 among in females and from 26 to 30 among by males. From the following diagrams and data was proved that this variation is normally distributed to the samples.



Diagrams showing the observed frequency distributions (solid lines) and the corresponding theoretical normal distributions (dot lines).

Class ♂	Theoretical frequencies	Observed frequencies
26	1.5552	3
27	5.9904	4
28	10.7936	9
29	8.8224	13
30	3.9040	3
Totals	31.0656	32

$\bar{X} = 28.28$        $N = 32$        $S = 1.1140$

Class ♀	Theoretical frequencies	Observed frequencies
19	1.3110	2
20	8.4042	6
21	22.2318	23
22	24.2052	27
23	10.6605	9
24	1.9525	2
	Totals 68.7652	69

$\bar{X} = 21.59$        $N = 69$        $S = 1.0192$

By applying the  $X^2$  test (goodness — of — fit) between theoretical and observed frequencies we got the following results:

1) For male individuals  $X^2 = 4,49$ , with 2 degrees of freedom and significance level 5%,  $X^2_{0,05[2]} = 5,59 > X^2 = 4,49$

2) For female individuals  $X^2 = 1,66$ , with 3 degrees of freedom and significance level 5%,  $X^2_{0,05[3]} = 7,81 > X^2 = 1,66$

In both cases the results are not significant, and therefore the variation, i.e. the number of teeth on the pectines, shows a normal distribution.

d<sub>2</sub>). We have examined samples of northern (Mandamados, Mitimna) and of the southern locality (Plomarion, Vatera, Polihnitos) of the island in order to find out if they are homogenous as to the number of teeth on the pectens in the two abovementioned localities. By applying the  $X^2$  test separately for female and male individuals, we proved that the samples of northern and southern locality are from the same population.

1) For male individuals  $X^2 = 4,24$ , with 4 degrees of freedom and significance level 5%,  $X^2_{0,05[4]} = 9,49 > X^2 = 4,24$ .

For female individuals  $X^2 = 2,73$ , with 5 degrees of freedom and significance level 5%,  $X^2_{0,05[5]} = 11,1 > X^2 = 2,73$

FAMILY                      CHACTIDAE Pocock, 1893

GENUS                        Euscorpius Thorell, 1876

## 2. *Euscorpius carpathicus* (Linnaeus, 1767)

### a. *Synonyms*:

R. Kinzelbach (1975) refers among the others the following synonyms for this species:

*Scorpio carpathicus* Linnaeus, 1767: *Syst. Nat.*, **12**, ed., *Holmiae*, I (2) : 1038.

*Euscorpius ciliciensis* Birula, 1898: *Horae Soc., ent., Ross.*, **33** : 136.

*Euscorpius koschewnikowi* Birula, 1900: *Jzv. Obsliub., gest., Moskau*, **98**, (3, 1): 8-20.

*Euscorpius candiota* Birula, 1903: *Ann., Mus., Zool., St., Petersburg*, 1903:298.

#### b. Ecology:

In contrast to *Mesobuthus gibbosus* it doesn't show a wide enough distribution on the island.

It was found mostly in damp dark places of houses (cellars, granaries etc.) as well as in the fields under stones and shrubs etc.).

#### c. Distribution:

Whereas the species *Euscorpius carpathicus* abounds in the Greek fauna not only on the continent but also on the Greek islands it seems to be rare in the neighbouring Turkish fauna. Tolunay (1959) mentions that only one individual of the said species was found during his researches in the area of Sinoppe.

Kinzelbach (1975) mentions that individuals were found at times in Konstantinople by Hadji in 1930, on Pringipos islands in the Sea of Marmara, in Tsanakale and elsewhere.

In Greece it was found by many scientists in various areas, as for instance in Parnis and Larissa by Werner (1928) on Karpathos by Helversen (Kinzelbach, 1970), on Krete by Birula (1903).

Curcic (1972) in his work under the title «Considerations upon the geographic Distribution and Origin of some populations in the genus *Euscorpius* Thorell (Chactidae, Scorpiones)» presents us a map which shows the insular distribution of *Euscorpius carpathicus* in Greece. On this map we see the islands of Corfu, Zakynthos, Krete, Antiparos and others. This species displays generally a wide distribution in the world.

Kaestner (1957) refers for the distribution begining from Northern Africa and it spreads over Spain, Southern France, Sardinia, Corsica, Italy, Eastern Alps, South Carpathians, Balkan peninsula, Asia Minor

and reaches in the Caucasus. Its occurrence in Jugoslavia is also widespread (Curcic, 1972).

*d. Distribution on the island:*

Agiassos: (G) 20 August 1976, 5♀ and 5♂.

Mandamados: (T<sub>1</sub>) 7 May 1975, 6♀ and 1♂.

» : (T<sub>2</sub>) 20 July 1975, 2♀.

Plomarion: (P<sub>3</sub>) 25 July 1976, 1♂.

» (Kournela): (K<sub>3</sub>) 28 July 1976, 2♀.

*e. Biometric elements:*

By applying below the X<sup>2</sup> test and the Yates' correction as to the variation «number of trichobothria on the pedipalp tibia» among female individuals which derived from the locality of Agiassos and from the locality of Mandamados, we proved that there is significant difference between the individuals of the two abovesaid localities.



*Map of Lesbos showing the stations of the samples.*

Locality	seven trichobothria	eight trichobothria	Total
Agiassos	0	5	5
Mandamados	7	1	8
Total	7	6	13

$X^2 = 9,48$ , with 1 degree of freedom and significance level 5 %,  $X_{0,05[1]}^2 = 3,84 < X^2 = 9,48$

From Yates correction 
$$X_c^2 = \frac{\left( Ad - bc + \frac{N}{2} \right)^2 N}{(a+b)(c+d)(a+c)(b+d)} = 5.85$$
, hence

again we have  $X_{0,05[1]}^2 = 3.84 < X^2 = 5.85$ .

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## ΠΕΡΙΛΗΨΗ

### ΟΙ ΣΚΟΡΠΙΟΙ ΤΟΥ ΝΗΣΙΟΥ ΛΕΣΒΟΣ

ἀπὸ

Δ. ΒΟΥΛΑΛΑ καὶ Dr. K. ΜΙΧΑΛΗ

(*Ἐργαστήριο Ζωολογίας τοῦ Πανεπιστημίου Θεσσαλονίκης*)

Μελετήθηκαν οἱ σκορπιοὶ τοῦ νησιοῦ Λέσβος. Κατὰ τὴ συστηματικὴ ἐπεξεργασία τῶν δειγμάτων διαπιστώθηκε ὅτι αὐτὰ ἀνήκουν σὲ δύο εἶδη: στὸ *Mesobuthus gibbosus* (Brullé, 1832) τῆς Οἰκογένειας Buthidae καὶ στὸ *Euscorpius carpathicus* (Linnaeus, 1767) τῆς Οἰκογένειας Chactidae.

Ἀπὸ τὴ μελέτη τῆς ποικιλότητος τοῦ ἀριθμοῦ τῶν δοντιῶν στὰ χτένια, τόσο στὰ ἄρσενικά ὅσο καὶ στὰ θηλυκὰ ἄτομα τοῦ *Mesobuthus gibbosus*, βρέθηκε ὅτι τὸ γνῶρισμα τοῦτο παρουσιάζει κανονικὴ κατανομὴ γιὰ τὰ πρὸς μελέτη δείγματα.

Ἐφαρμόζοντας τὸ  $X^2$  κριτήριο στὸ παραπάνω γνῶρισμα, ἀποδείχτηκε ὅτι τὰ δείγματα τῆς Βόρειας καὶ Νότιας περιοχῆς τοῦ νησιοῦ προέρχονται ἀπὸ τὸν ἴδιο πληθυσμό.

Τέλος μὲ τὸ  $X^2$  κριτήριο διαπιστώθηκε ὅτι ὑπάρχει στατιστικὰ σημαντικὴ διαφορὰ ὡς πρὸς τὸν ἀριθμὸ τῶν τριχοβοθρίων, ποὺ βρίσκονται στὴν κνήμη τῆς ποδολαβίδας, σὲ ἄτομα θηλυκὰ τοῦ *Euscorpius carpathicus*, ποὺ προέρχονται ἀπὸ δύο διάφορες περιοχὲς τοῦ νησιοῦ.