

## SOME TOPICS ON DISTRIBUTION PATTERNS OF THE GENUS *MESOBUTHUS* IN THE NEAR EAST BASED ON ECOLOGICAL DATA (SCORPIONES: BUTHIDAE)

By P. CRUCITTI

As stated by FET (1980:165) with reference to USSR scorpions: "Although Scorpions have been quite well investigated as regards their systematics, informations on their ecology is fairly fragmentary", we can establish the same for the Near East scorpiofauna too. At least 7 species are known to exist in the Balkan area and 11 in Anatolia, Turkish Armenia and Kurdistan.

Taxa belonging to the monophyletic Family Buthidae, at specific and subspecific levels, increase from 2 along the European border of the Mediterranean Basin (Iberian Peninsula, Southern France and Balkans), to 5-6 in Turkey, while in Iran they are no less than 33.

*Mesobuthus*, a widely distributed genus in the Near East and Central Asia, is represented by 1 species in the Balkan Peninsula, 2 in the USSR, 3 in Turkey and 5, with at least 11 subspecies, in Iran and this in connection with the increase of arid environments, steppe and desert formations (BONACINA, 1980; FET, 1988; FET and MADGE, 1988; FRANCKE, 1981 and 1985; FRANCKE and SOLEGLAD, 1981; KINZELBACH, 1975, 1980 and 1982; SISSOM, 1987; STAHNKE, 1972; VACHON, 1966; VACHON and KINZELBACH, 1987).

Comparative ecology of the Old World Buthids was investigated by FET (1980) who, in the southeast Kara-Kum, Turkmenia, USSR, processed data on the relative abundance, seasonal and diurnal activity and habitat distribution of five psammophilous species belonging to the genera *Mesobuthus*, *Liobuthus*, *Anomalobuthus* and *Ortochirus*.

The ecology of *Mesobuthus gibbosus* in the Pindus Mountains, northern border of its european range, was analyzed by CRUCITTI and MARINI (1987). The distribution of this species covers most of the Aegean area, including the island of Crete, Cyprus and a large portion of the Anatolian plateau (Fig. 1). In the Pindus, large populations were found on red soils and shrub formations covering less than 10%, with *Quercus coccifera* as the commonest species; on

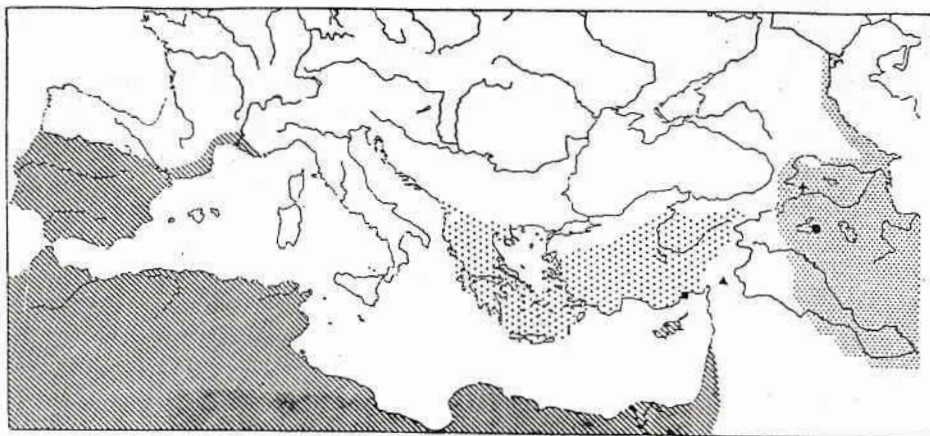


Figure 1. The circummediterranean distribution of *Buthus occitanus* (lines), *Mesobuthus gibbosus* (wide points) and *M. eupeus* (fine points) from KINZELBACH (1975:24), with few modifications. Marks indicates the position of sites as follows: square: Mersin; triangle: Gaziantep; circle: Van; +: Kars.

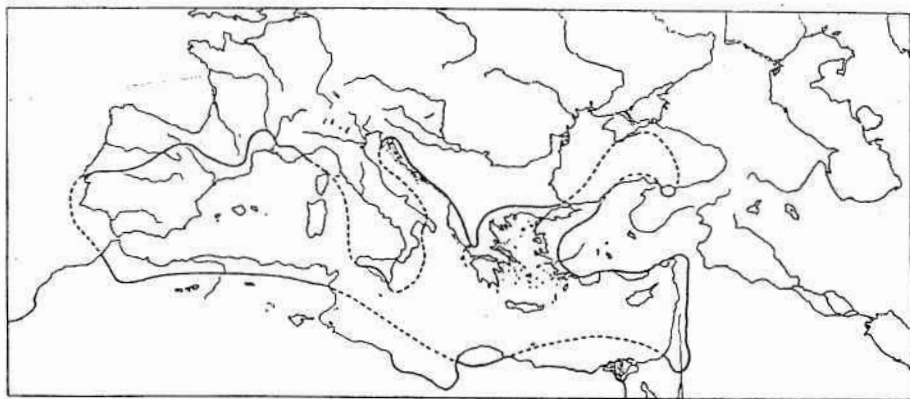


Figure 2. The distribution of the kermes oak *Quercus coccifera* according to FENAROLI and GAMBI (1976:324), with few modifications.

slopes with a S-SW exposure and slope between 4° and 30°, generally more than 10°; ground denudation was caused by goat and sheep grazing and human deforestation. Although *M. gibbosus* can be considered a xerophilous species, the largest populations were found on slopes looking onto river valleys characterized by a certain degree of moisture.

The meaning of the previous mentioned factors in the distribution of *Mesobuthus* scorpions has recently received some confirmations from our preliminary researches on populations of Southeast Anatolia and Turkish Armenia where we collected some hundreds of specimens and processed data on their ecology during the 1988 and 1989 expeditions of the Societa Romana di Scienze Naturali in the Near East. A check-list of the sites with ecological observations will precede our preliminary conclusions.

Collecting Site 1. 20 km NW from Gaziantep along the road for Narli, 30-31 July and 6 August 1988, elevation 800-850 meters, S-SE exposure and slope between 23° and 24°. A limestone plateau with brown-red soils and shrubs of *Quercus coccifera* and *Juniperus* sp., streams and natural channels of water. Many *M. cf. gibbosus* were collected together with some *Scorpio maurus* and undetermined Solifuga. Two *Mesobuthus* females with 48 and 37 first instar young pickaback and one with 13 second instar young were discovered under stones. Litter size, female and litter weight, in grams, and the ratio between these parameters, are presented in Table 1.

Table 1. Litter size (N), female weight (F) and litter weight (L) in grams, of *M. cf. gibbosus* females from coll. site 1.

N	F	L	F/L	L/N
48	1.5	0.4	3.75	0.008
37	1.4	0.6	2.33	0.016
16	0.9	0.2	4.50	0.012

Collecting Site 2. Mount Artuz near Gevas, SE bank of Lake Van, 10 August 1988, elevation 1900-2050 meters, E exposure, slope 32° approximately. A mountainous steppe with Euphorbiaceae and Carduaceae. *M. cf. eupeus* was abundant and three pairs, probably in courtship behaviour, were discovered under stones. Scorpions' weight (17 specimens) was found to be between 0.2 and 1.6 grams.

Collecting Site 3. NW of Susuz near Kars, 15 August 1988, elevation 1700 meters, S-SE exposure and slope between 24° and 25°. Mountainous steppe and brown soil with a large population of *M. cf. eupeus* along a slope with a torrent-like river at the foot. Two scorpions were often collected under the same stone, three in one case; many were found near their exuviae. The weight of 25

specimens was found to be between 0.1 and 1.5 grams.

Collecting Site 4. Ayva Gedyi near Mersin, 30 July 1989, elevation 1210 meters, E exposure and slope 11° approximately. Red soil and limestone rocks with *Juniperus* and *Q. coccifera* shrubs. Water was not abundant and *M. cf. gibbosus* was rarely found.

Collecting Site 5. Between Yenikoy and Aslankoy near Mersin, 1 August 1989, elevation 1150-1200 meters, E exposure and slope 13° approximately. Red soil with *Q. coccifera*, scanty water and rare Scorpions and Solifuga. A female of *M. cf. gibbosus* with seven young was collected.

Collecting Site 6. Yavca near Mersin, 2 August 1989, elevation 1150 meters, SE exposure and slope 13° approximately. Red soil with *Q. coccifera*, scanty water and uncommon scorpions (*M. cf. gibbosus* and *S. maurus*) and Solifuga.

These preliminary data possibly emphasize the role of some physical features of the environment such as type of substrate, vegetation cover, exposure, slope and water abundance in the distribution of *Mesobuthus* scorpions. Biotopes which provide favourable shelters for *M. gibbosus* in Pindus, northern Greece, are, to all appearance, similar to those in southern Turkey inhabited by populations of *M. gibbosus*. Figure 1 shows the distribution of European Buthidae together with two *Mesobuthus* species of the Anatolian Plateau. Figure 2 shows the range of *Q. coccifera*. One can note the good overlap between the distribution of *Buthus occitanus* and *M. gibbosus* and the range of the kermes oak in the Mediterranean basin. It is reasonable to believe as a working hypothesis, that the same climatic and/or edaphic factors might be responsible for these two similar distributions, but obviously, we need much more information to corroborate this hypothesis in the future.

Furthermore, in this ecological context, it may be of a certain interest to evaluate the importance of competition with syntopic scorpions of other families and with Solifuga, in the elucidation of the main features of the distribution and abundance of Buthid populations in Greece and Turkey.

### Abstract

Some features of the distribution of the genus *Mesobuthus* in Greece and Turkey in relation to ecological factors are discussed according to previous researches of the author on *M. gibbosus* in Northern Greece and more recent observations on *M. cf. gibbosus* and *M. cf. eupeus* populations of Anatolia and Turkish Armenia.

## Περίληψη

Συζητούνται ορισμένα χαρακτηριστικά του γένους *Mesobuthus* στην Ελλάδα και την Τουρκία σε σχέση με οικολογικούς παράγοντες βασισμένα σε προηγούμενες έρευνες του συγγραφέα πάνω στο *M. gibbosus* στη βόρεια Ελλάδα και σε πρόσφατες παρατηρήσεις σε πληθυσμούς των *M. cf. gibbosus* και *M. cf. eurus* από την Ανατολία και την τουρκική Αρμενία.

## REFERENCES

- BONACINA A., 1980.- Sistematica specifica e sottospecifica del complesso "*Euscorpium germanus*" (Scorpiones, Chactidae). *Riv.Mus.civ.Sc.nat. "E.Caffi"* Bergamo 2: 47-100.
- CRUCITTI P., MARINI F., 1987.- Ecologia di *Mesobuthus gibbosus* (Brulle, 1832) nel Pindo (Epiro e Tessaglia, Grecia) (Scorpiones, Buthidae). *G.it.Ent.* 3: 291-303.
- FENAROLI L., GAMBI G., 1976.- *Alberi. Dendroflora italica*. Museo Tridentino di Scienze Naturali, Trento.
- FET V., 1980.- Ecology of the Scorpions (Arachnida, Scorpiones) of the Southeastern Kara-Kum. *Ent.Rev.Washington* 59: 165-170.
- FET V., 1988.- A catalogue of scorpions (Chelicerata: Scorpiones) of the USSR. *Riv.Mus.civ.Sc.Nat. "E.Caffi"* Bergamo 13: 73-171.
- FET V., MADGE R.B., 1988.- *Calchas* Birula, 1899, a valid name, not a homonym of *Calchas* Klug, 1850 (Scorpionida, Iuridae and Coleoptera, Melyridae). *Bull.Br.arachnol.Soc.* 7(8): 252.
- FRANCKE F.O., 1981.- Taxonomic and zoogeographic observations on *Iurus Thorell* (Scorpiones, Iuridae). *Bull.Br.arachnol.Soc.* 5(5): 221-224.
- FRANCKE F.O., 1985.- Conspectus genericus scorpionorum 1758-1982 (Arachnida: Scorpiones). *Occ.Pap.Mus.Texas Tech Univ.* 98: 1-32.
- FRANCKE F.O., SOLEGLAD M.E., 1981.- The Family Iuridae Thorell (Arachnida: Scorpiones). *J.Arachnol.* 9: 233-258.
- KINZELBACH R., 1975.- Die Skorpione der Ägäis. Beiträge zur Systematik, Phylogenie und Biogeographie. *Zool.Jb.Syst.* 102: 12-50.
- KINZELBACH R., 1980.- Zur Kenntnis des kaukasischen Skorpions *Calchas nordmanni* Birula, 1899 (Scorpionida: Chactidae). *Verh.naturwiss.Ver. Hamburg* 23: 169-174.
- KINZELBACH R., 1982.- Die Skorpionsammlung des Naturhistorischen Museums der Stadt Mainz. - Teil I: Europa und Anatolien. *Mainzer Naturw.Archiv* 20: 49-66.

- SISSOM W.D., 1987.- First record of the scorpion *Paraiurus nordmanni* (Birula, 1899) (Scorpiones, Iuridae) in Greece. *J.Arachnol.* **15**: 272.
- STAHNKE H.L., 1972.- A key to the genera of Buthidae (Scorpionida). *Ent.News* **83**: 121-133.
- VACHON M., 1966.- Liste des Scorpions connus en Egypte, Arabie, Israel, Liban, Syrie, Jordanie, Turquie, Irak, Iran. *Toxicon* **4**: 209-218.
- VACHON M., KINZELBACH R., 1987.- On the taxonomy and distribution of the scorpions of the Middle East. *Proc.Symp.Fauna Zoogeogr.Middle East*. Mainz 1985, F. Krupp, W. Schneider, R. Kinzelbach eds.: 91-103.

Societa Romana di Scienze Naturali  
Via Fratelli Maristi 43  
I-00137 Rome, Italy