

DIVERSITY, ABUNDANCE AND DOMINANCE OF THE EPIGEAL ARTHROPODS IN THE VINE CROP, COROD LOCALITY, GALAȚI COUNTY, SOUTHERN MOLDAVIA, ROMANIA, 1983

VARVARA MIRCEA, PAȘA MARIN

ABSTRACT

The aim of the paper is to present the taxonomic structure of the epigeal arthropods (classes, orders of insects, families of Coleoptera, species of Carabidae, their abundance and dominance from a vine crop, Corod locality, southern Moldavia, Romania, 1983).

The material of the paper was collected from a vine crop, Corod village, Galați County, 1983, using 12 Barber pitfalls, protected against rainfalls, with preservative liquid, 4 %, formalin solution .

The interval and continuous period of collecting was between May 4th and September 22nd, 1983; in total 141 days. There were performed 15 collectings and analysed 180 samples. In total, there were collected 5,804 specimens of epigeal arthropods.

Taxonomically, the scientific material belonged to: three classes of arthropods; insects are eudominant 5,506 (94.87%); six orders of insects, Coleoptera 1,116 (20.27%); eleven families of Coleoptera, family Carabidae 165, (15.17%) with 11 species. *Pseudoophonus rufipes* De Geer 1774 with 70 specimens (42.42%) and *Carabus coriaceus* Linnaeus 1758, 58 individuals (35.15 %).

The general ecological characteristics of the species of Carabidae are presented in table no.5.

Key words: Epigeal arthropods, classes, orders of insects, families of Coleoptera, species of Carabidae, abundance, dominance, ecological characteristics

Introduction

Nature, biosphere, ecosphere are governed by natural, biological and ecological laws. The fundamental ecological law is the unity and interaction between environment and organisms.

The biotope within an ecosystem has a determinant taxonomic role on the biocoenosis.

Geographically, Corod locality belongs to the Tecuci Plain with temperate continental climate.

The aim of the paper is to present the variation of the relative abundance and dominance of the epigeal arthropods from a vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

Objectives of the paper: There were established 7 objectives of the paper: 1. Documentation on the subject of the paper ; 2. Collecting the material from the vine crop; 3. The taxonomic determination of the entomologic material; 4. Knowledge of the presence of the classes of arthropods, orders of insects, families of Coleoptera and the species of the family Carabidae in the ecological conditions of the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983; 5. Knowledge of the variation of the concrete values of the relative abundance and dominance of the classes of Arthropods, orders of insects, families of Coleoptera, species of Carabidae; 6. Discussion of the results; 7. Ecological requirements of those 11 species of

Carabidae identified in the Corod locality, Galați County.

The ecological factors influencing, by their variation, the plants, *Vitis vinifera* and their production are: soil and its texture, humidity, light and temperature. soil texture, higher humidity and temperature, southern, south-eastern, south-western slopes favorably influence the production of grapes.

Researches on the Carabidae (Coleoptera) in the period 1993-1997 in the vineyards of Galați county are published in 6 papers: 1. Tâlmăciu, Georgescu, 1993; 2. Tâlmăciu, Georgescu, Filipescu, 1994; 3. Varvara, Tâlmăciu, Georgescu, 1995; 4. Tâlmăciu, Georgescu, Filipescu, Bădeanu, 1996; 5. Tâlmăciu, Georgescu, Filipescu, Bădeanu, Radu, 1996; 6. Tâlmăciu, Georgescu, Mitrea, Filipescu, Bădeanu, 1997.

Material and methods

The region from where the collectings and researches were effectuated belongs to the South of Moldavia, Corod locality, Galați County, 1983.

The entomologic material is completely original and there was collected from the ecosystem of a vine crop to show the influence of the ecosystem on the number of taxonomic arthropods (classes of arthropods, orders of insects, families of Coleoptera), species of Carabidae, 1983 and their numbers.

* "Al. I. Cuza" University, The Faculty of Biology, Iași, Romania, e-mail: mvarvara@uaic.ro

To collect the material rationally, ecologically and continually, there were used 12 Barber pit-falls. The traps were arranged in three rows. Each row had four pit-falls. The distance among lines and pitfalls was 5 m, being covered a total surface of 225 square meters.

The pitfalls functioned in the ecosystem from May 5th till September 22nd, 1983, in total, 141 days.

There were effectuated 15 collectings and analysed 178 samples that is the content from 178 pit-falls to determine the individuals belonging to classes of arthropods, orders of insects, families of Coleoptera, species of Carabidae.

Results and discussions

The results of the paper are shown in five tables and represented graphically in four histograms.

In presenting the sub unities, results, discussions and conclusions, we followed and respected the natural, logical and psychological principle from general to particular.

Taxa exist through individuals having specific morphological characters from kingdom to species.

The main numerical characteristic of each taxon is the number of individuals.

The total number of collected individuals was 5,804 (Table1, Fig.1).

Table 1 - The taxonomic structure, abundance and dominance of the epigeal Arthropods classes from the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

| No. | Arthropods, Classes | Rel. abundance | % |
|-----|---------------------|----------------|------------|
| 1. | Myriapoda | 10 | 0.17 |
| 2. | Arachnida | 288 | 4.96 |
| 3. | Insecta | 5,506 | 94.87 |
| | Total | 5,804 | 100 |

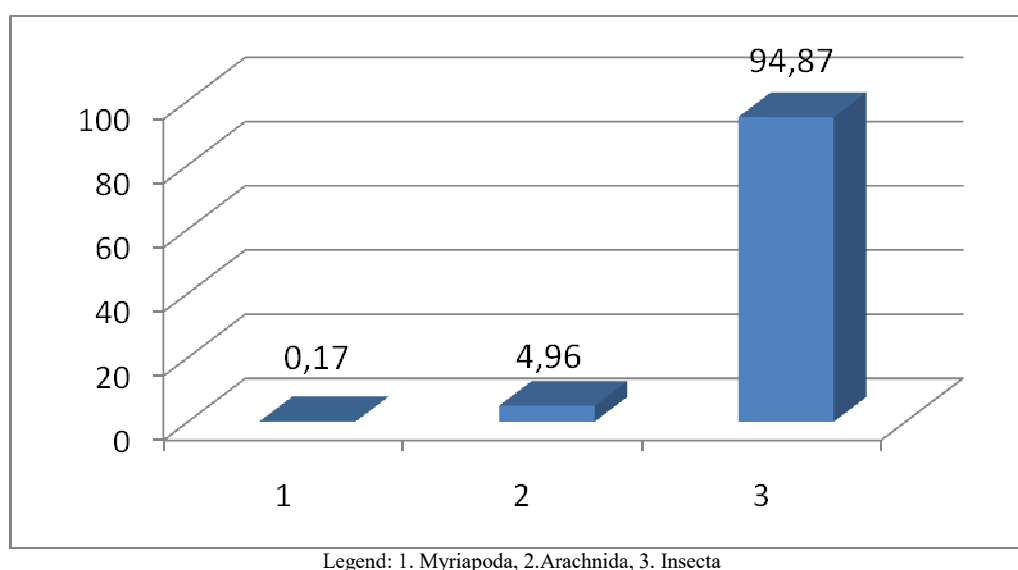


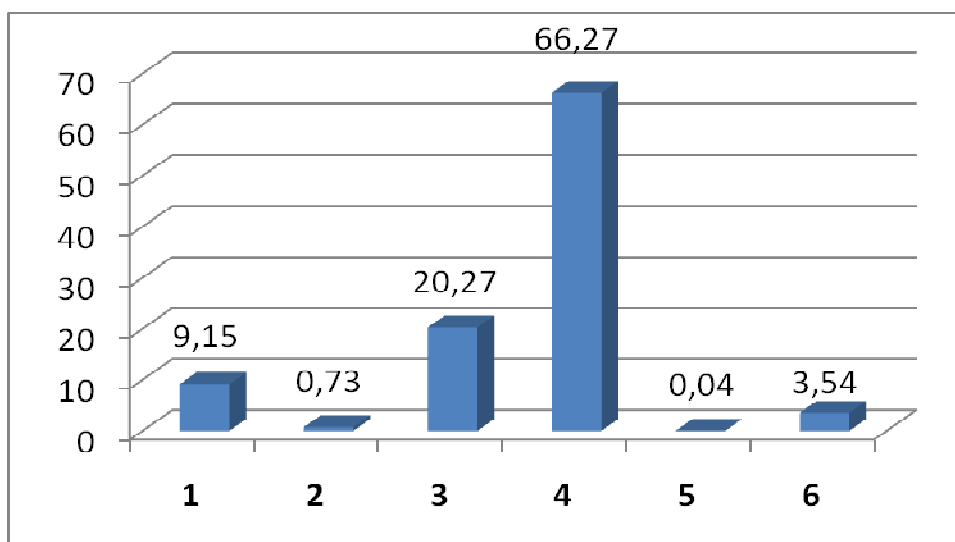
Fig. 1 - The percentage variation of the epigeal individuals of the classes of Arthropods from the vine crop ecosystem, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

The insects are represented through six orders. The orders Hymenoptera (66.27%) and

Coleoptera (22.27%) are best represented (Table 2, Fig. 2).

Table 2 - The taxonomic structure, abundance and dominance of the epigeal Arthropods (Orders of Insecta) from the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

| No. | Orders | Relative abundance | % |
|-----|--------------|--------------------|------------|
| 1. | Orthoptera | 504 | 9.15 |
| 2. | Heteroptera | 40 | 0.73 |
| 3. | Coleoptera | 1,116 | 20.27 |
| 4. | Hymenoptera | 3,649 | 66.27 |
| 5. | Lepidoptera | 2 | 0.04 |
| 6. | Diptera | 195 | 3.54 |
| | Total | 5,506 | 100 |



Legend: 1. Orthoptera; 2.Heteroptera; 3.Coleoptera; 4.Hymenoptera; 5.Lepidoptera; 6. Diptera

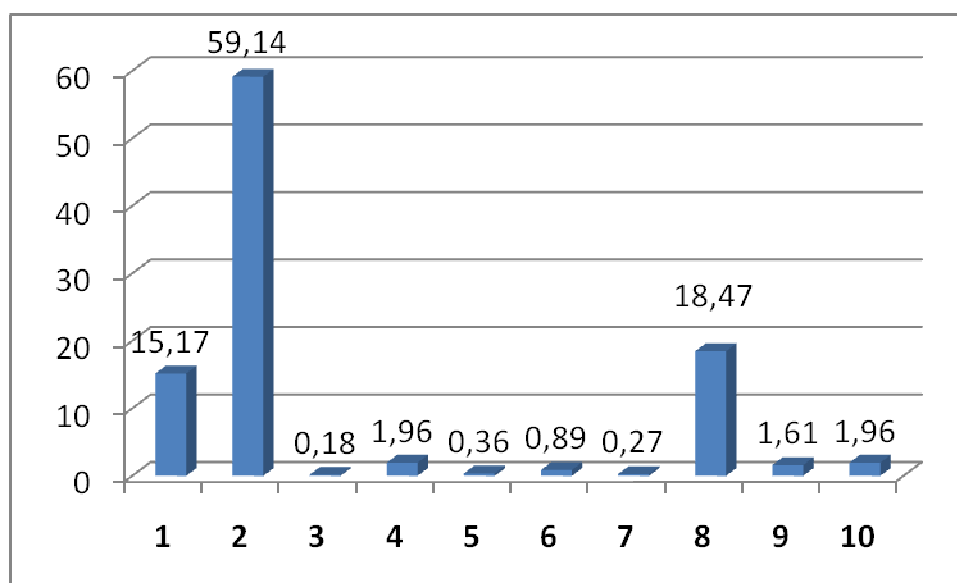
Fig. 2 - The percentage variation of the epigeal individuals of the Orders of Insecta from the vine crop ecosystem, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

Within the Order of Coleoptera, there were identified 10 families. The following families are represented in the following percentages:

Tenebrionidae (59.14%), Chrysomelidae (18.47%), Carabidae (15.17%) (Table 3, Fig. 3).

Table 3 - The taxonomic structure, abundance and dominance of the epigeal Arthropods (Families of Coleoptera) Corod locality, Galați County, Southern Moldavia, Romania, 1983.

| No. | Families | Abundance | % |
|-----|---------------|--------------|------------|
| 1. | Carabidae | 165 | 15.17 |
| 2. | Tenebrionidae | 663 | 59.14 |
| 3. | Scarabaeidae | 2 | 0.18 |
| 4. | Dermestidae | 22 | 1.96 |
| 5. | Histeridae | 4 | 0.36 |
| 6. | Elateridae | 10 | 0.89 |
| 7. | Cantharidae | 3 | 0.27 |
| 8. | Chrysomelidae | 207 | 18.47 |
| 9. | Coccinellidae | 18 | 1.61 |
| 10. | Curculionidae | 22 | 1.96 |
| | Total | 1,116 | 100 |



Legend: 1. Carabidae; 2.Tenebrionidae 3;Scarabaeidae; 4.Dermestidae; 5.Histeridae; 6.Elateridae; 7.Cantharidae; 8.Chrysomelidae; 9.Coccinelidae; 10.Curculionidae

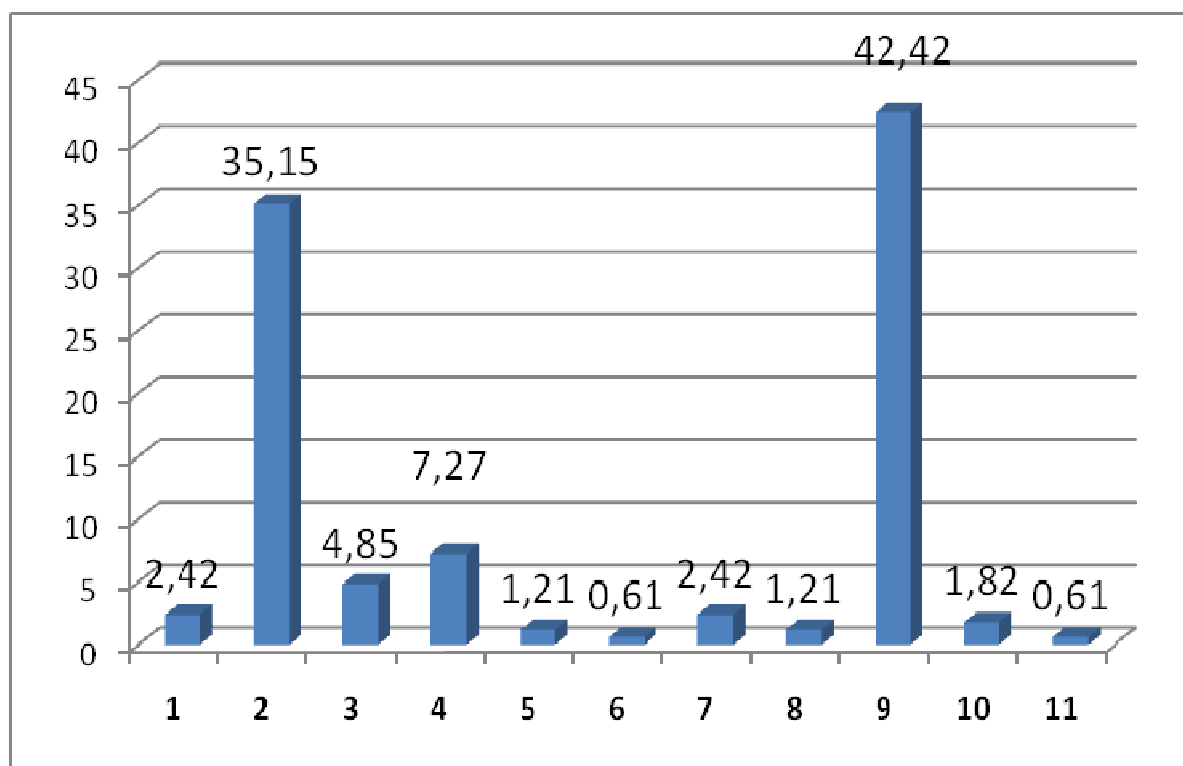
Figure 3 - The percentage variation of the total collected number of epigeal individuals of the Families of Coleoptera from the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

Within the family Carabidae there were determined 11 species. Two species are best

represented: *Pseudoophonus rufipes* (42.42%) and *Carabus coriaceus* (35.15%) (Table 4, Fig. 4).

Table 4 - The abundance and dominance of the epigeal species of Carabidae in the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983

| No. | Species | Relative abundance | % |
|-----|--|--------------------|--------------|
| 1. | <i>Calosoma auropunctatum</i> Herbst 1784 | 4 | 2.42 |
| 2. | <i>Carabus coriaceus</i> Kraatz 1877 | 58 | 35.15 |
| 3. | <i>Poecilus cupreus</i> Linnaeus 1758 | 8 | 4.85 |
| 4. | <i>P. sericeus</i> Fischer von Waldheim 1823 | 12 | 7.27 |
| 5. | <i>Calathus melanocephalus</i> Linnaeus 1758 | 2 | 1.21 |
| 6. | <i>Dolichus halensis</i> Schaller 1783 | 1 | 0.61 |
| 7. | <i>Amara equestris</i> Dejean 1831 | 4 | 2.42 |
| 8. | <i>A. convexior</i> Stephens 1828 | 2 | 1.21 |
| 9. | <i>Pseudoophonus rufipes</i> De Geer 1774 | 70 | 42.42 |
| 10. | <i>Harpalus politus</i> Dejean 1829 | 3 | 1.82 |
| 11. | <i>H. distinguendus</i> Duftschmid 1812 | 1 | 0.61 |
| | Total | 165 | 99.99 |



Legend: 1. *Calosoma auropunctatum*; 2. *Carabus coriaceus*; 3. *Poecilus cupreus*; 4. *P. marginalis*; 5. *Calathus melanocephalus*; 6. *Dolichus halensis*; 7. *Amara equestris*; 8. *A. convexior*; 9. *Pseudophonus rufipes*; 10. *Harpalus politus*; 11. *H. distinguendus*.

ig. 4 - The percentage variation of the total collected number of the epigeal species of Carabidae from the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

The five main ecological requirements of the species (reproduction type, humidity preference, habitat preference, food regime and zoogeographical distribution) are shown in table 5.

Table 5 - Main ecological characteristics of the species of Carabidae in the vine crop, Corod locality, Galați County, Southern Moldavia, Romania, 1983.

| No. | Species | 1 | 2 | 3 | 4 | 5 |
|-----|--------------------------------|------|------|-----|---|----------|
| 1. | <i>Calosoma auropunctatum</i> | Sp | M | OLS | Z | Wp |
| 2. | <i>Carabus coriaceus</i> | A | M | F | Z | E |
| 3. | <i>Poecilus cupreus</i> | Sp | M | OLS | Z | Wp |
| 4. | <i>P. sericeus</i> | Sp | Mcsb | Cr | Z | Wp.Pont. |
| 5. | <i>Calathus melanocephalus</i> | A,Sp | M | Eu | Z | T |
| 6. | <i>Dolichus halensis</i> | A | M | Cr | P | PL |
| 7. | <i>Amara equestris</i> | Sp | M | OLS | P | Wp |
| 8. | <i>A. convexior</i> | Sp | M | OLS | P | Es |
| 9. | <i>Pseudophonus rufipes</i> | A | M | OLS | P | Wp |
| 10. | <i>Harpalus politus</i> | Sp | M | OLS | P | Esb |
| 11. | <i>H. distinguendus</i> | Sp,S | M | OLS | P | T |

Legend: 1.Reproduction type; 2.Humidity preference; 3.Habitat preference; 4.Food regime; 5.Zoogeographical distribution; A.=Autumn; Sp.= Spring; S.= Summer ; M.= Mesophylous; Mx.= Meso-xerophylous ; Cr. = C rop; Eu.= Eurytopic; F= forest; Mcsb.= mezo-xerobiont; OLS.= Openlandscape ; Pont.= pontic; Wp. = West -Palaeartic ; E.= Europe; T. = Transpalaeartic ; Esb.= Euro-Siberian.

Discussions

Methodically, scientific discussions should include syntheses, comparisons and especially interpretations. Everything in the objective nature, in the living nature, in ecosystems is in unity, connection, action, interaction. Everything is connected to everything! Nothing without a cause and effect. Biotope, habitat with their ecological factors influence the presence of the number of species and individuals of a population due to the influence of its ecological factors (soil, the texture of the soil, the crop plant, temperature, humidity, food).

The interaction of the above mentioned ecological factors was far less favorable to the species of Carabidae in the Corod vineyard in 1983, reflected by the total number of species and individuals belonging to the Carabidae family.

Comparing our results with those published by the authors, Tălmăciu, Georgescu, Mitrea, Filipescu, Bădeanu (1997), from the Bujorului Hills vineyard, Galați county, there are significant differences: In the Corod Vineyard, 1983, 141 days of collecting, 11 species of Carabidae were collected, with a total of 165 individuals, compared to 20 species, represented by 2,377 individuals (Bujorului Hills, 1992). The percentage of species in the Corod vineyard was 35.48% lower compared to the Bujorului Hills, where the number of individuals was 93.31% higher, compared to 6.49%, Corod, 1983. Favorable or unfavorable local ecological factors dictate the number of species and individuals belonging to a biocoenosis. We can safely deduce that the moisture factor of the soil was the one that reduced the number of species and individuals in the vineyard crop, Corod, 1983.

The species collected from the concrete ecological conditions, Corod locality, 1983, belong to 100% mesophilic species, zoophagous species (45.45%) and pantophagous species (54.54%).

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Conclusions

The collecting effort of the epigeal material in the year 1983 from the vine crop, Corod, locality, 1983, the taxonomic identification of those 5,804 individuals (classes of arthropods, orders of insects, families of Coleoptera, species of Carabidae) give us the scientific right to conclude the following. Within

the epigeal fauna of arthropods, the present taxa in the vine crop Corod, 1983 are : Myriapoda, Arachnida, Insecta; six orders of insects, (Orthoptera, Heteroptera, Coleoptera, Hymenoptera, Lepidoptera, Diptera); 10 families of Coleoptera (Carabidae, Tenebrionidae, Scarabaeidae, Dermestidae, Histeridae, Elateridae, Cantharidae, Chrysomelidae, Coccinellidae, Curculionidae); 11 species of Carabidae (*Calosoma auropunctatum*, *Carabus coriaceus*, *Poecilus cupreus*, *P. marginalis*, *Calathus melanocephalus*, *Dolichus halensis*, *Amara equestris*, *A. convexior*, *Pseudoophonus rufipes*, *Harpalus politus*, *H. distinguendus*).

The best represented taxa through individuals in the vine crop, Corod locality, 1983, are: Insecta, Hymenoptera, Coleoptera, Tenebrionidae, Chrysomelidae, Carabidae, the species *Pseudoophonus rufipes* and *Carabus coriaceus* (Carabidae).

Rezumat

Scopul lucrării este de a prezenta structura taxonomică și variația numerică a artropodelor epigeice (clase, ordine de insecte, familii de coleoptere, specii de Carabidae (abundența și dominanța) dintr-o cultură de viță de vie, localitatea Corod, județul Galați, 1983.

Materialul lucrării este original și a fost colectat dintr-o cultură de viță de vie, satul Corod, județul Galați, Moldova de sud, în anul 1983, folosind 12 capcane Barber, protejate împotriva precipitațiilor, cu lichid de conservare 4 % soluție de formalină.

Intervalul și perioada continuă de colectare a materialului entomologic a fost între 4 mai și 22 septembrie 1983, în total, 141 de zile. Au fost efectuate 15 colectări și analizate 180 de probe (15 colectări x 12 capcane). În total, s-au colectat 5.804 exemplare de artropode epigeice.

Taxonomic, materialul colectat aparține la: trei clase de artropode; insectele sunt eudominante 5.506 (94,87%); șase ordine de insecte, ordinul Coleoptera 1.116 indivizi (20,27 %); unsprezece familii de coleoptere, familia Carabidae 165, (15,17 %) cu 11 specii. *Pseudoophonus rufipes* De Geer 1774 cu 70 de exemplare (42,42 %) și *Carabus coriaceus* Linnaeus 1758, 58 indivizi (35,15%).

Cerințele ecologice generale ale speciilor de Carabidae sunt prezentate în tabelul 5.

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