

EXPANSION AND ECOLOGY OF OCYPUS MUS (BRULLÉ, 1832),  
(COLEOPTERA, STAPHYLINIDAE) IN SLOVAKIA AND MORAVIA

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The present paper deals with the obvious expansion of the species *Ocypus mus* (Brullé, 1832) in Central Europe during last three decades. The periodicity of its findings in the rich material of the Hungarian Museum of Natural History is analysed. A special attention is paid to the habitat preference and distribution of *O. mus* in South Slovakia and Moravia. The quantitative collections from a wide spectrum of habitats in Slovakia and Moravia show that *O. mus* has become typical of the moderately humid or dry forests, copices and hedges in the oak or beech-oak vegetation tiers. It creates there a conspicuous autumnal aspect of the staphylinid communities which have been changed considerably due to the expansion of *O. mus*. The males predominate in all its populations.

Key words: expansion, ecology, *Staphylinidae*, habitat preference, Slovakia, Moravia.

The staphylinide *Ocypus mus* (Brullé, 1832) was considered by more ancient authors to be a characteristic pontomediterranean species (Fleischer, 1930, Roubal, 1936, Horion, 1965, Scherpeltz, 1968, Peetz and Kahle, 1977) and characterized *O. mus* as a rare species. At the end of the fifties there are known only few findings (Smetana, 1958, Löbl, 1960) from the warmest parts of South Slovakia. In 1971 *O. mus* was found for the first time on two Moravian localities (Šustek, 1977). These findings allowed to obtain some data about its seasonal dynamics and they indicated that *O. mus* could be more distributed in the warm parts of Moravia and Slovakia. Since that time, a rich material of *O. mus* was obtained during the extensive quantitative collections of Staphylinids in a wide spectrum of habitats in Slovakia and Moravia. It allows to conclude more, in the present paper, about its habitat preference and about changes of its distribution area and of population densities.

## Methods

The greatest part of the material was obtained by the pitfall trapping. The traps were exposed in a wide spectrum of habitats (fields, hedges, forests, flood plain forests and urban greenery) in Slovakia and in South Moravia during the years 1981 - 1990. The beetles dropped into the traps were taken approximately in one month intervals. A rich material from the Museum of Natural History in Budapest was used to study the distribution of *O. mus* in Hungary in more ancient periods and to estimate the changes of its population densities. This material was collected mostly individually and from a minor part by the pitfall traps.

## Material studied

Hungarian material - localities in the interior of Budapest: Budapest (without any specification) 8 ♂♂, 7 Buda 1 ♂, 1 ♀, Cuggerhegy 2 ♂♂, Diófas tető 1 ♂, Farkas hegy 1 ♂, Gelérhegy 1 ♂, Harmashatárhegy 2 ♂♂, 5 ♀♀, Hárshegy 2 ♀♀, Hideg kút 1 ♂, Hüvesvölgy 1 ♂, 3 ♀♀, János hegy 4 ♂♂, 1 ♀, Kelenföld 1 ♀, Kecsehegy 1 ♂, 1 ♀, Pinnye 1 ♀, Sashegy 1 ♂, Svábhegy 1 ♀, Szépvölgy 1 ♂, 3, Törökvesz 21 ♂♂, 13 ♀♀, Újlaki hegy 2 ♂♂, 2 ♀♀, Vadvédelmi tér 5 ♂♂, 1 ♀.

Hungarian material - localities in other parts of Hungary:

Cserénfa 2 ♂♂, 1 ♀, Harkány fürdő 1 ♀, Hortóbágy - Új Szent Margita, Margitai erdő 1 ♂, Óhati erdő 1 ♂, 2 ♀♀, Kiskunsági Nemzeti Park, Lakitelecek - Túserdő 1 ♂, 2 ♀♀, Izsák - Kalon tó 1 ♂, 2 ♀♀, Agas egyháza 1 ♂, 2 ♀♀, Kiskörös - Szücsierdő 1 ♀, Kunfehértó - Városerdő 5, 6, Kunfehértó - Holdtűz erdő 1 ♂, 2 ♀♀, Leánfalva 1 ♀, Lengyel Ekik 1 ♀, Nagyaróvár 3 ♀♀, Mátrafüred - Kékestető 1 ♂, Kozmári kilátó 1 ♀, Kallék völgy 2 ♂♂, Rákóczi forrás 2 ♀♀, Nagy egregy 1 ♀, Nógrád 1 ♂, Pápa 1 ♀, Pécs 1 ♂, Peczeli 1 ♀, Pillis hegység - Hoszóhegy 1 ♂, Simontornya 2 ♂♂, 2 ♀♀, Siófok 7 ♂♂, 6 ♀♀, Soprony 1 ♂, Súrje 3 ♂♂, Szár 1 ♀, Székesfehérvár 1 ♀, Szombathely - Budai hegy 1 ♂, Vác - Nagyszől 1 ♂, Velencei hegység 6 ♂♂, 4, Velencei hegység - Sukoró 1 ♂, Vámoly 1 ♂, Villányi hegység - Szársomlók kőbánya 7 ♂♂, 8 ♀♀, Zirc - Pintér hegy 2 ♂♂, 2 ♀♀, Aggtelek 2 ♂♂.

Ancient unpublished findings in Slovakia:

Pozsony (=Bratislava) 1 ♂, Rimaszombat (=Rimavská Sobota) 1 ♂, Nagysalló (=Tekovské Lužany) 1 ♀, both in Museum Nat. History, Budapest.

Recent Slovakian localities:

A) City interior and suburbs of Bratislava: Sitina, an oak - locust tree forest, 32 ex.: Horský park - a park of a very natural character, 24 ex.; Kalvária - a forest on the city centre margine, 15 ex.; Mlynská dolina valey, at the time of collecting a complex of aluvial meadows and alder stands, 37 ex.; Kopáč - a drained poplar forest in the vicinity of the oil refinery Slovnaft, 223 ex. (for details see fig. 3), Vrakuňa - a drained, anthropogenously strongly affected remnant of a flood plain forest on the dead branch of Small Danube, 2 ex., Sad Janka Kráľka - an english park on the Danube bank, 1 ex., Kramáre - an adult oak forest studied after a soil surface fire, 127 ♂♂, 70 ♀♀, Devínska kobyla - a natural forest stepe, 3. 8. 1988, 1 ♀, a natural oak forest: 31. 8. 1988 1 ♂, 4. 10. 1988 150 ♂♂, 38 ♀♀, 3. 11. 1988 104 ♂♂, 27 ♀♀.

B) Other Slovakian localities:

Jurský Šúr - Panonský háj, a xerophilous oak forest 1061 ex. in 1988 (for details see fig. 3), Jurský Šúr - banks of small lakes in the vicinity of the Biological Station of the Comenius University, 3. 9. 1988 1 ♂, 1. 10. 1989 7 ♂♂, 4 ♀♀, 20. 10. 1988 2 ♂♂.

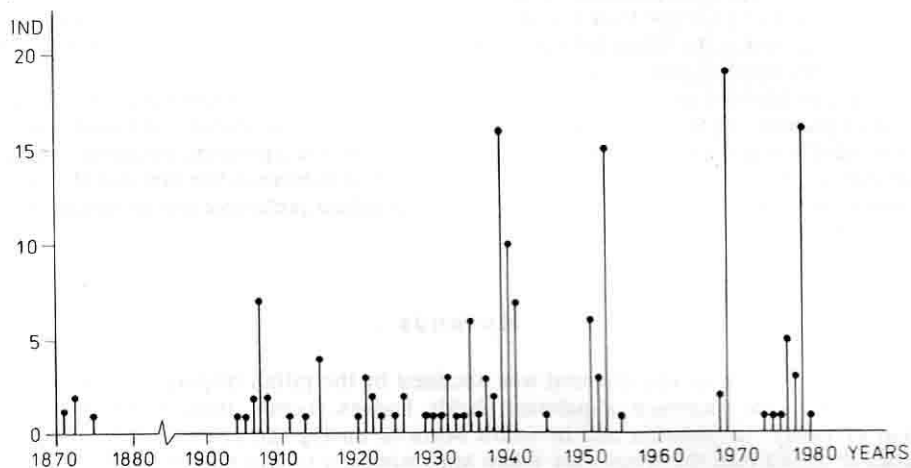


Fig. 1. The time distribution of the findings of *O. mus* in the collections of the Museum of Natural History in Budapest since 1870.

Čížov - a poplar forest on the banks of the lake Lyon, 128 ex. (for details see fig. 3). Jahodná - a poplar forest of the place of a former branch of Small Danube, 3. 8. 1989 2 ex. 5. 9. 1989 2 ex.

Moravian localities:

Horní Věstonice, seminatural hedges, 20. 9. 1984 1 ♂, 22. 9. 1985 1 ♂, Brod nad Dyjí, a remnant of a strongly drained flood plain forest, 12. 8. 1986 1 ♂, Ledníca na Moravě - Horní les, a drained flood plain forest 13. 11. 1986 3 ♂, 25. 8. 1987 1 ♂, 10. 11. 1987 2 ♂♂, 29. 6. 1988 1 ♀, 19. 10. 1988 6 ♂♂, 2 ♀♀, Bulhary, an artificial windbreak 3. 7. 1986 8 ♂♂, 3 ♀♀, 18. 8. 1986 4 ♂♂, 2 ♀♀, 13. 11. 1986 2 ♂♂, 25. 8. 1987 1 ♂, 10. 11. 1987 10 ♂♂, 9 ♀♀.

## Results and discussion

The material in the collections of the Museum of Natural History in Budapest shows that *O. mus* occurred nearly in whole territory of Hungary before the end of the fifties. The border of its distribution area coincided approximately with the Slovak Hungarian border. There were only few findings north of this line. This state corresponds probably with that described by Smetana (1958). The first findings in museum come from the years 1870 - 1875. Until the year 1908 there are no specimens of *O. mus* in the collections, but after that year *O. mus* starts to occur regularly in a small number of specimens. Approximately during the twenties and thirties a slight increase in specimens number may be observed. Since the year 1939 the specimens number in the collections increases considerably and it exhibits an obvious periodicity with the cycle length of cca 11 - 15 years. The increase of specimens number after the year 1939 indicates probably the begin of an expansive phase which resulted later in the spreading of *O. mus* towards the north and west. This expansion wave reached Slovakia and Moravia during the late fifties and sixties. It is obvious especially when comparing the extremely high number of *O. mus* in the forest Panonský háj found in 1988 and its absence during the intensive investigations of Korbel (1951). The progression of the expansion is evidenced also by the individuals number increase in Pavlovské vrchy hills during the period 1971 - 1981 (Šustek, 1983), when the abundance of *O. mus* raised from one individual on 95 individuals in three sites and its relative abundance reached on 0.51, 2.43 and 10.43 % respectively. The abundance of other congeneric species, however, was not affected. An other manifestation of the continuing expansion is the penetration of the habitats out of its preference optimum indicated by Tóth (1984). The great dispersal power of *O. mus* might be observed also in the oak forest in Bratislava - Kramáre, where *O. mus* was the only species occupying in a considerable number of individuals the burnt area after the fire at 31 August 1990.

The figures 2 and 3 show that *O. mus* occurs sporadically during the whole spring. Its regular occurrence begins in June and by the end of August starts to increase rapidly and it culminates by the end of September or middle of October. Then it sinks suddenly and the last individuals occur at the beginning of December.

During the whole time all populations studied were strongly dominated by males. There is a question, whether the dominance of males is a symptom of the expansion phase as it may be observed in more carabid species penetrating the city centres or areas with unfavourable conditions (Müller, 1970, Šustek, 1984).

The quantitative collections of Staphylinids in a wide spectrum of habitats in Slovakia and in south Moravia allow to specify more exactly the habitat preference of *O. mus*. Conformly to the extrapolation made by Šustek (1977) and to the data of Tóth (1984) *O. mus* is distributed predominantly at the elevations up to cca 400 m and in the 1. - 3. vegetation tier (oak, beech-oak, oak - beech, Raušer, Zlatník, 1966). However, in Hungary some individuals were found even at the elevation of 800 - 1000 m. *O. mus* seems to be a characteristic forest species. The forest types inhabited by *O. mus* range from the drier flood plane forests (Ulmion) to the forests of the limited hydric row (Raušer, Zlatník, 1966). It avoids the regularly inundated forests, manifestingly wet sites and probably also the poplar monocultures. In a low number it penetrates also copices and hedges. It does not occur in fields and open areas. Zoocenotically it may play a role of a highly eudominant or dominant species, even in the anthropogenously changed ecosystems in cities. The

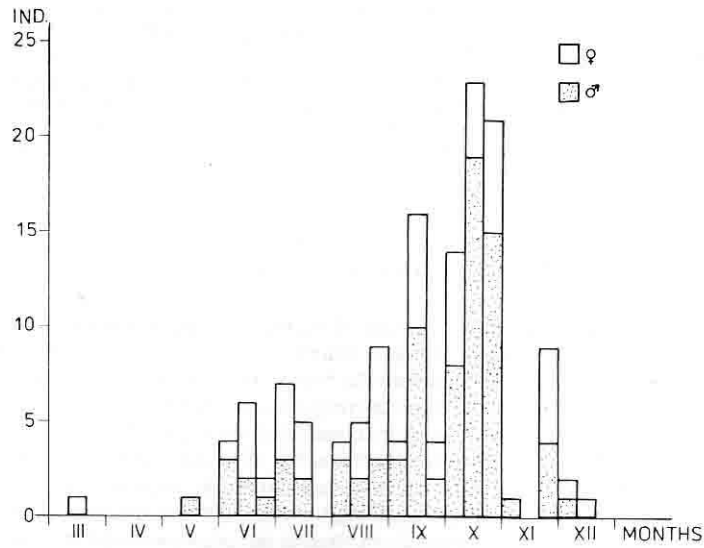


Fig. 2. The seasonal dynamics and sex ratio of *O. mus* reconstructed on the base of the exactly localised material from the collections of Museum of Natural History in Budapest.

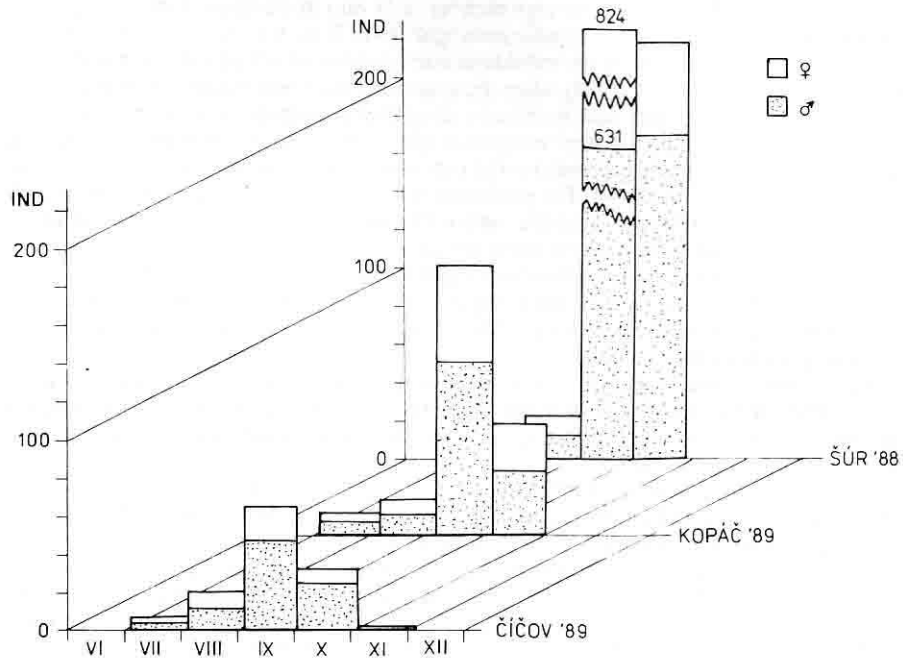


Fig. 3. The seasonal dynamics and sex ratio of *O. mus* in three South Slovakian localities (for the characteristics of the localities see Material).

structure of the natural or anthropogenously changed staphylinid communities has changed considerably due to the expansion of *O. mus*. As a consequence of its seasonal dynamics a distinctive autumnal aspect arises in these communities.

### Conclusion

The species *O. mus* finds in an expansive phasis since the forties. The long term distribution of the findings of *O. mus* in the museal collections indicates that it exhibits a periodicity of cca 11-12 years. It is a characteristic forest species preferring the moderately humid sites. It may penetrate also the anthropogenously influenced ecosystems. Its occurrence culminates in September and October and all populations were dominated by males.

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### EXPANZIA A EKOLÓGIA DROBČÍKA *OCYPUS MUS* (BRULLÉ, 1832), (COLEOPTERA, STAPHYLINIDAE) NA SLOVENSKU A NA MORAVE

### Zbyšek Š u s t e k

Príspevok sa zaoberá nápadnou expanziou druhu *Ocypus mus* (Brullé, 1832) zaznamenanou v strednej Európe v posledných troch desaťročiach. Rozoberá sa periodicita nálezov v bohatom materiáli Prírodovedeckého múzea v Budapešti. Osobitná pozornosť sa venuje jeho ekológii. Kvantitatívne zbery zo širokého spektra typov prostredia zo Slovenska a Moravy ukazujú, že *O. mus* je typický druh stredne vlhkých a suchších lesov, preniká do remízok a krovitých medzí v dubovom až dubovo-bukovom vegetačnom stupni. V spoločenstvách drobčíkovitých, ktoré sa vďaka jeho expanzii silne zmenili, vytvára výrazný jesenný aspekt. V populáciách *O. mus* nápadne prevažujú samce.

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