

LESZEK GRÜM

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Seasonal changes in density and number of individuals captured of *Pterostichus niger* Schall. (*Carabidae, Coleoptera*)

Murdoch (1966) criticizes the results of my study (Grüm 1959) in which I demonstrated the inadequacy of seasonal variations in the number of individuals caught and population density of *Pterostichus niger* Schall.

Murdoch (1966) asserts that the divergence I found (Grüm 1959) between seasonal variations in the number of individuals caught and density was caused by erroneous estimate — due to supposed acceptance of no dilution — of population density and to the assumption that in addition to density and activity, another particular aspect of Carabid behaviour — “site penetration” — affected trapping results.

In connection with the above-mentioned publication by Murdoch (1966) I should like to rectify certain inaccuracies in the criticism he makes, most probably due to difficulty in reading the Polish text of my study (Grüm 1959), and express my views on the relation he questions between density and number of individuals caught.

It is of course obvious — and here I agree with the author of the above criticism — that the number of individuals caught in traps depends on their activity and population density. Activity may, however, take various forms, e.g. rapid passage of individuals through the study area, or repeated capture of marked individuals remaining in that area for a longer time (Grüm 1965). The time of site penetration by an individual was used by me to indicate activity recorded in the form of repeated captures of an individual, and not to describe a different aspect of Carabid behaviour.

In addition the statement made by Murdoch (1966) that in estimating the density of *P. niger* I assumed that no individuals of this species entered the area, is based on a misunderstanding. I did in fact assume a constant value of entry, pointing out that this condition is not invariably fulfilled. I agree, however, with the opinion put forward by this author that density estimates made for *P. niger* in periods 0 and 1 of the occurrence of this species are unreliable. In the remaining periods

of its occurrence (from period 2 to 5) the differences in the density of this species, calculated by Murdoch (1966) and by me (Grüm 1959) are considerable, but the direction of changes in density is similar (Fig. 1).

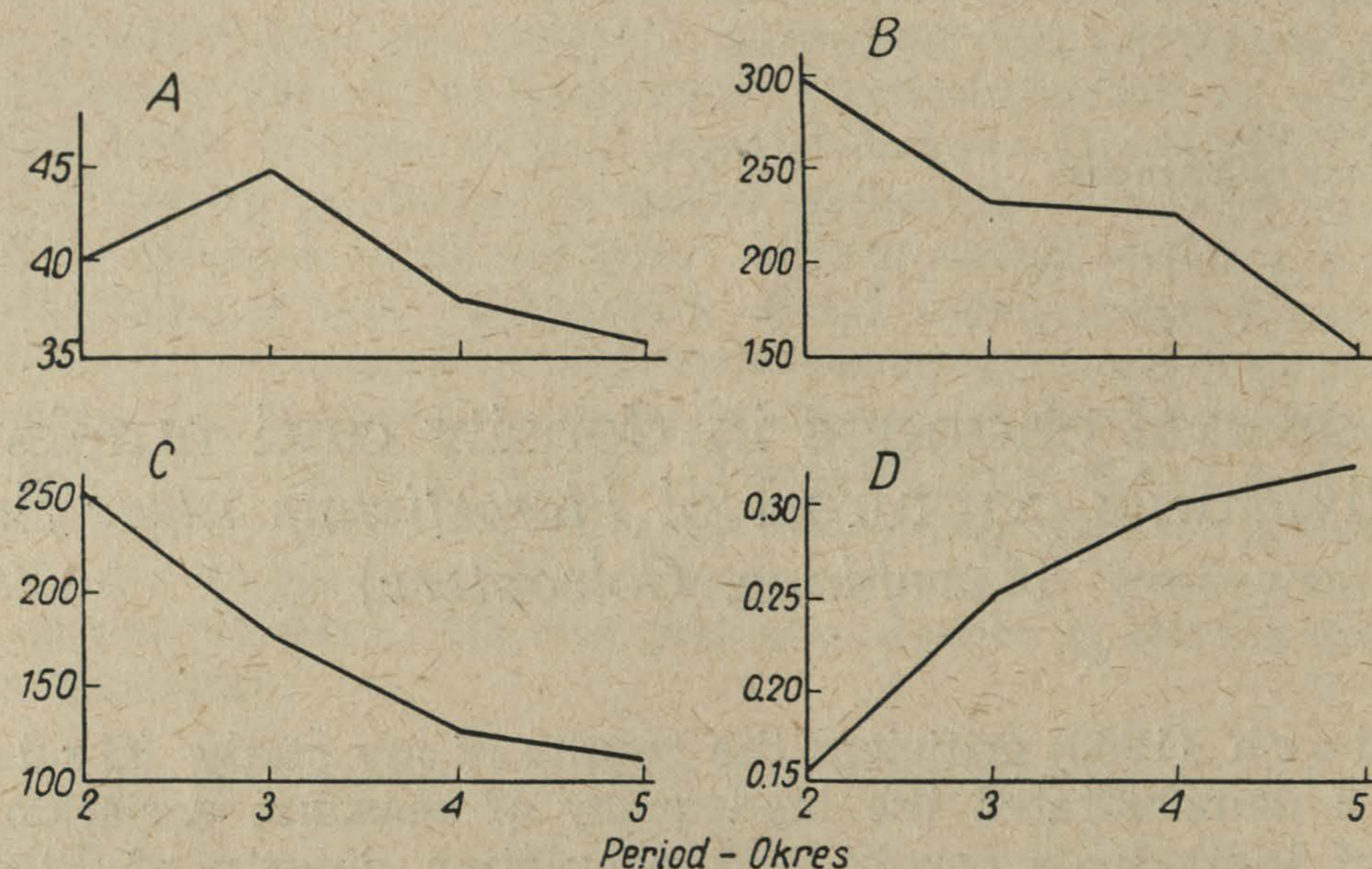


Fig. 1. Seasonal changes in density and number of individuals captured of *P. niger* A — number of individuals captured, B — density counted by Grüm (1959), C — density counted by Murdoch (1966), D — relation between number of individuals caught and density counted by Murdoch (1966).

Sezonowe zmiany liczby złowionych osobników i zagęszczenia *P. niger*

A — liczba złowionych osobników, B — zagęszczenie wyliczone przez Grüma (1959), C — zagęszczenie wyliczone przez Murdocha (1966), D — stosunek liczby złowionych osobników do zagęszczenia wyliczonego przez Murdocha (1966).

I cannot therefore concur with Murdoch's conclusion (1966) that there is agreement between seasonal changes in density and the number of individuals of *P. niger* caught. The systematic increase in the ratio of individuals of *P. niger* caught to the density of this species, calculated by the above author (Fig. 1) convincingly argues against this conclusion (Murdoch 1966).

References

- Grüm, L. 1959 — Seasonal changes of activity of the *Carabidae* — *Ekol. Pol. A*, 7: 255—268.
- Grüm, L. 1965 — The significance of the migration rate of individuals in the regulation of intensity of penetration of the habitat by populations of two species of the *Carabidae* — *Ekol. Pol. A*, 13: 575—591.
- Murdoch, W. W. 1966 — Sampling *Carabidae* by pitfall trapping — *Ekol. Pol. B* 12: 125—128.

O sezonowych zmianach zagęszczenia i liczby złowionych osobników *Pterostichus niger* Schall. (*Carabidae*, *Coleoptera*)

Streszczenie

Publikacja ta jest odpowiedzią na polemikę Murdocha (1966) twierdzącego, jakoby uzyskana przeze mnie (Grüm 1959) rozbieżność sezonowych zmian liczby złowionych osobników i zagęszczenia populacji *Pterostichus niger* Schall., wynikała z błędnej oceny zagęszczenia tego gatunku oraz przyjęcia, że prócz zagęszczenia i aktywności, inny szczególny aspekt behawioru *Carabidae* — „penetracja środowiska“ — wpływa na rezultat połowów pułapkowych.

Prostując nieścisłości krytyki, wynikające zapewne z trudności odczytania polskiego tekstu mojej pracy, wyjaśniam, że termin penetracja środowiska przez osobnika był przeze mnie zdefiniowany jako forma aktywności rejestrowanej w postaci wielokrotnego łowienia znakowanego osobnika, a nie dla oznaczenia innego niż aktywność aspektu behawioru *Carabidae*.

Jeśli chodzi o kwestionowane stosunki pomiędzy sezonowymi zmianami liczby złowionych osobników i zagęszczeniami populacji *P. niger*, to mimo dużych różnic w poziomie zagęszczenia wyliczonego przeze mnie (Grüm 1959) i przez Murdocha (1966), przebieg zmian zagęszczenia jest podobny i nie pokrywa się ze zmianami liczby złowionych osobników (fig. 1).