Abstract

Gammarus kischineffensis Schellenberg, 1937, has been recorded for the first time in Poland. The differences in morphology between this and other Polish species are discussed.

The short list of Polish freshwater gammarids can be enriched with a new species, Gammarus kischineffensis Schellenberg, 1937, which has been found lately in many sites, mainly in the drainage area of the upper reaches of the river San - a right affluent of the river Vistula.

The first very superficial description of this species (locus typicus: Kischinev, Moldavia, USSR) without any drawings (Schellenberg, 1937) has been completed by Dobreanu & Manolache (1939), on the basis of Romanian material. In their 1939 paper, the species in question appeared under the name Gammarus chisinauensis. Cărăuşu, Dobreanu & Manolache (1955), in their comprehensive monograph of the Romanian Amphipoda, rightly resume the original name. They give many localities of G. kischineffensis in Moldavia, east of the Carpathian range, in the basins of the rivers Siret and Prut. Strákroba (1962, 1967, 1969) records this species from the easternmost part of Czechoslovakia. Finally, it is apparent from the monograph of Dedju (1967) and from the papers of Jalynskaja (1968, 1970) that G. kischineffensis is the most common gammarid species of the entire Dniester and Prut drainage basins, i.e. in the southern part of the Ukrainian and in the Moldavian Soviet Republics.

G. kischineffensis is a rather eurytopic species. The Romanian authors report it in particular from small streamlets, from the drainage channels, and even from very small forest springs. Jalynskaja (1968) also found this species mainly in the streams of the basin of upper Dniester, where the temperature could reach even 25°C, while Dedju (1967) collected G. kischineffensis in various types of water bodies, such as subterranean waters, springs, streams and rivers, as well as ponds and man-made reservoirs. Dedju observed, however, that G. kischineffensis occurs in stagnant waters only when these are supplied by run-
ning waters. In larger riverbeds - in the middle and lower courses of Dniester, and in lower course of Prut - this species has not been found. Dedju supposes that it cannot live there through competition by the expansive ponto-caspiian species of the genera Dikerogammarus, Pontogammarus, and Chaetogammarus. In the uppermost courses of the spring streams of these basins, G. kiohineffensis is replaced by representatives of the G. balcanicus-group. According to Dedju (1967) in the basin of the Prut, G. kiohineffensis and G. balcanicus each have separate ranges. Jalynskaia (1968, 1970) working in the same general area did not confirm such a disjunct distribution pattern; however, she also observed that G. balcanicus dominated in waters nearer to the springs, which are cooler, richer in Na⁺ ions and poorer in Ca²⁺ and K⁺ ions - this in contradistinction to G. kiohineffensis.

Fig. 1 shows the approximate distribution area of G. kiohineffensis, based upon the hitherto known data, covering also new records from Poland. It seems very probable that the distribution area of this species reaches in reality farther to the east, possible to the river Boh basin; it is possible that it penetrates also to the north to the river Pripet basin, taken its euryocicious abilities into consideration. In the west, the Carpathian range appears to be a strong barrier preventing the spreading of G. kiohineffensis. The Slovakian locality, in an affluent of the river Uh (Straškrebka, 1962, 1969) (indicated by a crosslet in fig. 2) shows that it succeeded in crossing this mountain ridge to reach the river Tisa drainage system, perhaps through one of the nearest "weak places", viz. the Uzhocka pass (889 m above sea level). At the foot of Carpathians G. kiohineffensis spread in north-western direction and reached the Vistula basin, so it has crossed the watershed between the Baltic and Black Sea drainage areas.

In fig. 2 the localities of G. kiohineffensis in Poland are plotted. Fourteen of these are situated in systems draining into the Baltic (river San and its affluents) whereas five drain into the Black Sea (rivulets Strwiąż and Mazanka - affluents of Dniester). The northermost site of G. kiohineffensis known up to now is the river San near the village Nozdrzec; judging from the local nature of the river it is very probable that the species will have penetrated further downstream.

The following list enumerates the records of this gamaard new to Polish fauna. The samples have been deposited in the Zaklad Zoologii Ogólnjej, Uniwersytet Lodzi (ZZOUL) and the Zoologisch Museum Amsterdam (ZMA).

2) Streamlet crossing the way Bukowsko - Tokarnia, distr. Sanok, 9-VIII-1967, leg. S. Niesziołowski, alt. about 450 m; ZZOUL, cat. no. 162.
3) Streamlet near Bukowsko, distr. Sanok, 9-VIII-1967, leg. S. Niesziołowski, alt. about 400 m; ZZOUL, cat. no. 163.
4) Streamlet flowing from Mount Chryszačata to Rabe, distr. Lesko, 19-VIII-1967, leg. S. Niesziołowski, alt. about 750 m; ZZOUL, cat. no. 169.
6) Stream Caryski near the bridge below the mouth of the streamlet Caryficz, distr. Ustrzyki Dolne, 17-VII-1967, leg. J. Kruszewski, alt. about 650 m; ZZOUL, cat. no. 217.
7) Stream Gluchy or its affluent near Rosochate, along the path from Haniów to Oetre, distr. Ustrzyki Dolne, 16-VII-1967, leg. J. Kruszewski, alt. about 500 m; ZZOUL, cat. no. 215.
9) River Solinka near Bukowiec, distr. Lesko, VII-1971, leg. F. and J.D. van Mansvelt, alt. about 450 m; ZMA, cat. no. Amph. 103,386.
12) River Strwiąż (affluent of the Dniester), at the western border of the district of Ustrzyki Dolne, VIII-1971, leg. F. and J.D. van Mansvelt, alt. about 500 m; ZMA, no.Amph.103,405.
13) Affluent of the stream Warkowa, W. of Olszani- 
cia near the bridge, distr. Ustrzyki Dolne, 
VIII-1971, leg. F. & J.D. van Mansvelt, ZMA, 
cat. no. Amph. 103.381.

14) Affluent of the Stary Potok, W. of Ustjanowa, 
distr. Ustrzyki Dolne, VIII-1971, leg. F. & 
J.D. van Mansvelt, ZMA, cat. no. Amph. 103.382.

15) Affluent of the streamlet Mazanka (an afflu- 
ent of the Dniestier), in Michniowiec, where 
the road crosses the water (without a bridge), 
distr. Ustrzyki Dolne, VIII-1971, leg. F. & 
J.D. van Mansvelt, ZMA, cat. no. Amph. 103.406.

16) Affluent of the streamlet Mazanka, E. of Byst-
tre, distr. Ustrzyki Dolne, VIII-1971, leg. F. & 
J.D. van Mansvelt, ZMA, cat. no. Amph. 103. 
407.

17) Spring-like affluent of the Mazanka, about 
800 m W. of Michniowiec, distr. Ustrzyki Dolne 
VIII-1971, leg. F. & J.D. van Mansvelt, ZMA, 
cat. no. Amph. 103.408.

18) Stream Gluchy, S.E. of Polana, distr. Ustrzy-
ki Dolne, VIII-1971, leg. F. & J.D. van Mans-
velt, ZMA, cat. no. Amph. 103.409.

19) Stream Rabiański Potok, between Czarne 
and Bystre, S.W. of Baligród, distr. Ustrzyki Dol-
ne, VIII-1971, leg. F. & J.D. van Mansvelt, 
ZMA, cat. no. Amph. 103.387.

In many localities, viz. the numbers 3,4,5,6,7, 
13,14, and 19, the species was accompanied by G. 
balcanicus.

In Polish waters also, G. kischineffensis oc-
curs mainly in small and medium-sized streams and 
and rivers, occupying there microhabitats typical for 
freshwater gammarids, such as crevices under the 
stones, in waterweeds, between dead leaves and 
twigs, etc. Judging from the data recorded by De-
dju (1967) it can safely be assumed that this spe-
cies will be able to populate the littoral zone of 
the Solina dam reservoir.

To facilitate the recognition of G. kischineff-
ensis we are giving below some characteristic 
features of this species:

1) The lack of calceoli in adult males. In the 
majority of the Gammarus species, at any rate in 
all Polish freshwater gammarids, calceoli are 
present.

2) The posterodistal corner of basis of the 7th 
peraeopod is produced into a distinct projection; 
the width of this posteriorly protruding part of 
this basis is about half of the width of ischium 
(in large males somewhat less) and its angle is 
slightly acute (or rectangular). In this character 
G. kischineffensis resembles the balcanicus-group.

In the pulex-group this projection is almost 
absent, while in G. lacustris G.O. Sars, 1864 and 
G. vigrensia Micherdzinski, 1959 the width of this 
protruding part of basis is distinctly less than 
the half width of ischium (usually about 1) where-
as at the same time the angle is rounded (fig. 3 
A-E). According to Cărtuşu et al. there exists a 
group of 3 short setules on the inner surface of 
this projection of basis of P7 in G. kischinef-
ensis. In our material we have found neither set-
ules nor spines in this place. In G. lacustris 
and G. vigrensia 1 or 2 setules are found here, 
while in the G. pulex- and G. balcanicus-groups 
the posterodistal corner of the basis usually 
beats 1 spine (sometimes also 1 or 2 setules).

3) The outer margin of exopodite of the 3rd uro-
pod is sparsely armed with setae (usually 5 to 14, 
in larger specimens up to 20 setae are present); 
some of these setae (1 to 10) are feathered. 
In this feature G. kischineffensis resembles G. 
vigrensia. It is worth adding that even in young 
specimens, of 5-6 mm long, at least one plumose 
seta is always present (fig. 3 F-G).

4) The flagellum of A2 is in G. kischineffens-
sia somewhat "pulex-like" (slightly expanded 
proximally and with a sort of brush on the inner 
side, not so dense however as in G. pulex).

5) The setosity on the hind margins of P3 and P4 
is of medium density - richer than in balcanicus 
group, slightly sparser than in G. vigrensia,dis-
tinctly sparser than in G. lacustris and in the 
pulex-group.

6) The hind corner of the 2nd epimeral plate is 
acutely produced, but not to the extent as in the 
lacustris-group (fig. 4 A-E).

7) The feature in which G. kischineffensis dif-
ders from G. vigrensia is the comparatively short 
er gland cone in the first species; in G. kischi-
neffensis the end of this cone never reaches the 
distal end of the 3rd peduncular segment of A2, 
while in G. vigrensia the gland cone even reach 
even beyond the end of this segment (fig. 4 F-G).
8) A minor but useful feature to separate young and female specimens of *G. kischineffensis* from the respective representatives of the *balcanicus*-group (which are often found together with *G. kischineffensis*), especially when 3rd uropods are lacking, is the armature of the lower, inner side of the peduncle of Ai. In *G. kischineffensis* there exists a group of comparatively long setules (depending on the size of the animal from 1 to 3 setules per group) on the third peduncle segment. The length of the longest setule always attains or exceeds the width of the segment. In the *balcanicus*-group this segment sometimes bears a group of setules as well (usually 1 or 2 setules), but the length of the longest seta does not exceed half the width of the segment. On the inner side of the second segment of Ai, larger specimens of *G. kischineffensis* usually possess two groups of setae, *G. balcanicus* only one. (fig. 4 H-K).

ACKNOWLEDGEMENTS

The authors are indebted to Mrs. Piona van Mansvelt; Mr. S. Niesiokowski, M. Sc.; Dr. J. Kruszewski; Dr. A. Piechocki; Mr. B. Soszyński, M. Sc.; and Mr. A. Witkowski, M. Sc., for their help in collecting and providing certain samples; many thanks are due also to Drs. S. Pisker for his help in preparing the manuscript and for valuable remarks. The contribution of the second author to this paper, is part of the fulfillment of a M. Sc. examination essay in Taxonomic Zoology at the University of Amsterdam.

REFERENCES


Dr. Krzysztof Jażdżewski
Zakład Zoologii Ogólnej
Instytutu Botaniki i Zoologii
Uniwersytetu Łódzkiego
ul. Nowopchochodniowa 12/16
Łódź, Poland.

Drs. Jan Diek van Mansvelt
c/o Instituut voor Taxonomische Zoologie
der Universiteit van Amsterdam
Plantage Middenlaan 53
Amsterdam, The Netherlands.

Received: October 25, 1972
Gammarus kischineffensis Schellenberg, 1937, in Poland. The small cross indicates the Slovakian site of this species in the affluent of the river Uh (Straškraba, 1962, 1969).

Fig. 1  The approximate distribution area of *Gammarus kischineffensis* Schellenberg, 1937 in eastern Europe. Black areas indicate the Carpathian Mountain chain (altitude about 1000 m above sea level).

Fig. 2  Locations of *Gammarus kischineffensis* Schellenberg, 1937, in Poland. The small cross indicates the Slovakian site of this species in the affluent of the river Uh (Straškraba, 1962, 1969).
Fig. 3 A – E: The basis of the 7th pereopod in some Polish Gammarus species (scale I): A, G. kischineffensis, ♂ 10.5 mm, from stream Prowcza, locality nr. 5; B, G. balcanicus (-group), ♂ 11 mm, spring in Bieszczady Mts.; C, G. wigrensis, ♂ 14 mm, river Czarna Hancza, paratype; D, G. lacustris, ♂ 12.5 mm, peat-pond in Bionie near Łęczycą; E, G. pulex, ♂ 13 mm, river Uniesięż in Sianów. Long setae inserted on the proximal part of the basis are omitted.

F and G: The third uropod of Gammarus kischineffensis: F, ♂ 13 mm, from river San, locality nr. 1 (scale I); G, juv. 5.5 mm, from the same locality (scale II). The armature of the endopodite and of the inner margin of the exopodite is omitted.

H – K: Peduncle segments of A1, from the inner side: H, G. kischineffensis, ♀ 10 mm, from river San, locality nr. 1 (scale I); I, G. balcanicus (-group), ♀ 9.5 mm, from stream flowing from Chryszczata Mts., locality nr. 4 (scale I); J, G. kischineffensis, juv. 5.5 mm, from locality nr. 4 (scale II); K, G. balcanicus (-group), juv. 6.5 mm, from spring in Komuńca, Bieszczady Mts. (scale II).
Fig. 4  A – E: Second epimeral plate in some Polish *Gammarus* species (all scale I)
A, *G. kischineffensis*;
B, *G. balcanicus*;
C, *G. wigrensis*;
D, *G. lacustris*;
E, *G. pulex*.

F and G: The proximal part of A2 (both scale I).
F, *G. kischineffensis*;
G, *G. wigrensis*.
The same specimens have been used as in fig. 3.