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AN ROINN TALMHAIOCHTA AGUS IASCAIGH
(Department of Agriculture and Fisheries)
FO-ROINN IASCAIGH (Fisheries Division)

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Insect emergence data from four small lakes in the south and southwest of Ireland

by

J. J. BRACKEN AND D. A. MURRAY

Zoological Department, University College, Dublin.

ABSTRACT

Emerging insects from four small lakes in Counties Cork and Kerry were captured using floating Mundie emergence traps during the period from late April to early November 1969. The data obtained are examined to provide information on distribution, emergence periods and seasonal fluctuations in numbers of insects present. The traps were serviced at weekly intervals and the weekly maximum/minimum temperature fluctuation was observed. Chironomids were the dominant forms emerging during the period of investigation, 51 species were recorded but only five were present in significant numbers; 19 Trichopteran species were taken, but only four in significant numbers; one species each of Chaoboridae and Ephemeroptera was taken. There does not appear to be a direct correlation between high temperatures and peak emergence within the Chironomidae, however the peak emergence of *Chaoborus flavicans* in Lough Avaul coincides with the maximum temperature recorded (15°C). Differences in peak emergence periods of some similar species in different lakes are apparent.

INTRODUCTION:

Information regarding the distribution and season of emergence of Plecoptera, Ephemeroptera and Trichoptera, in Ireland has been collected over a period of years by the Inland Fisheries Trust (Kennedy, pers. comm.). The data relate, however, mainly to the large limestone trout lakes and to certain rivers. One of us (D.A.M.) has made a study of the chironomids of the large trout lakes and of some small coarse fish lakes in the Midlands. Little was known about the pattern of insect emergence in the smaller trout lakes off the limestone, especially in the southern region of the country.

Such information would be helpful to trout anglers, since success in fly fishing for trout depends, firstly, on the presence at the surface of the water of sufficient insects of worthwhile size to attract the trout to the surface; and secondly, on the use of an artificial fly sufficiently suggestive of the natural insects present to interest the trout.

The Inland Fisheries Trust controls a number of small lakes in the south and south-west of Ireland. In some of these lakes, spawning facilities for trout are limited or lacking and the lakes are maintained as trout fisheries largely by artificial stocking. Ecological conditions otherwise are fairly typical of those in other lakes in this region which have self-maintaining trout populations. As the Trust's staff pay frequent visits to the lakes in question, it was decided to put two or three insect emergence traps on each of four lakes, which could be serviced in the course of weekly visits. A maximum-minimum thermometer was installed in each lake. In this way, some idea could be obtained of the kinds of insects emerging in these lakes during the spring, summer and autumn. A more exhaustive sampling programme was not feasible because of pressure of other work.

The programme was devised and the traps constructed by Mr. Noel Hackett of the Inland Fisheries Trust, who sorted and carried out a preliminary "size-and-type" analysis of the insect collections. The insects were subsequently examined and identified to species by the authors. *Caenis* spp, Hydroptilid caddis and some of the smaller chironomids were disregarded because of their relative unimportance from the point of view of trout angling. *Caenis* may, at times, be freely taken by trout but such trout are almost impossible to catch, while very small caddis and chironomids are of little significance as trout food.

The lakes selected for trapping were Loughs Avaul, Aderry, Kilbrean and Reenydonegan, the last mentioned being included because (see below) it was in a state of transition from brackish to fresh water and thus had some features of particular ecological interest. The field programme was carried out over a period of twenty-seven weeks, from late April to early November, 1969.

TOPOGRAPHY:

The positions of the four lakes are shown in Fig. 1. and chemical, geological, floral and fish data are briefly indicated in Table 1.

Lough Avaul, County Cork, is a shallow body of water, average depth 3 metres. It has virtually no spawning facilities for salmonids. Brown trout, *Salmo trutta* L. are stocked at frequent intervals to maintain a population in the lake.

Lough Aderry, also in County Cork, is a spring-fed lake with underground drainage to the River Womanagh. This river flows into Youghal Bay, County Cork. It may be described as a lowland lake, average depth 1.5 metres. Originally the lake held a population of rudd, *Scardinius erythrophthalmus* (L.). Eradication, using rotenone, was carried out by the Trust in 1961 and again in 1968. Rainbow trout, *Salmo gairdneri* Rich. were introduced into the lake on several occasions between 1954 and 1963. Since 1963, however, it has been maintained as a brown trout fishery.

Kilbrean Lake, County Kerry, is again a spring-fed lake. There were no fish in the lake until 1940, when some unfed brown trout fry were stocked. From 1957 to 1964 rainbow trout were stocked periodically. Brown trout, stocked also during the same period, have been the only species planted since 1964.

Lough Reenydonegan, County Cork, is situated near the town of Bantry. Originally this lake was a small inlet of the sea into which two small streams flowed. The formation of a bar at its mouth caused it to become a freshwater lake. The bar was breached in 1944 which allowed an ingress of sea water to take place. Some eight years later the mean salinity was 17‰ and a typical brackish-water fauna was present. The bar was built up and consolidated and a sluice installed by the Trust in 1959. By 1965, salinity had decreased to 0.5‰ and it has since remained at about that level. The present fauna may now be regarded as freshwater but a number of brackish-water species still survive in the lake viz. *Leptomysis* sp., *Gammarus zaddachi*, and *Chironomus salinarus*.

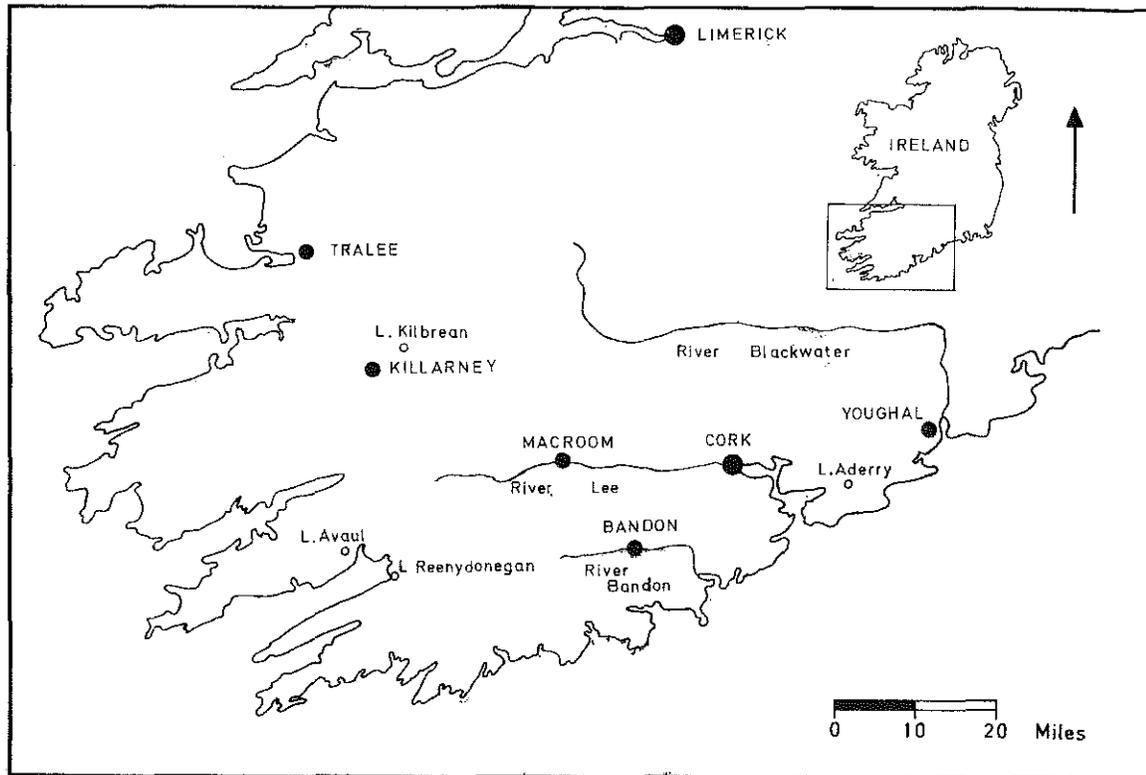


Fig. 1. Sketch map showing location of lakes dealt with in this paper. (Based on the Ordnance Survey by permission of the Government, Permit No. 1833).

MATERIALS AND METHODS:

The emergence traps were built to the design of Mundie (1956) with some modifications of the collecting-jar arrangement which made its removal and replacement quicker and easier to carry out. During the survey eleven traps were in use. Each trap was, as mentioned, serviced once a week and the insects collected were forwarded to the Zoology Department, University College, Dublin for definitive identification on completion of the field programme. Temperature data were collected each week by max./min. thermometers in each lake (Figs. 2-5). Details of the numbers of traps used, their location and the depth of water under each trap, together with details of the substratum and the plant life present in each lake are summarised in Table 2.

RESULTS:

Seventy-two identified species of insects were taken by the emergence traps (Table 3). Of this total 51 species were members of the Chironomidae; 1 species belonged to the Chaoboridae; 1 species to the Ephemeroptera and 19 species were members of the Trichoptera. For each species identified the total number taken by the traps per lake over the entire season is shown in Table 3, together with the maximum number present in any single week's collection and the dates of peak emergence.

Only five species of Chironomids were present in significant numbers; *Microtendipes pedellus*, *Limnochironomus nervosus*, *Pentapedilum sordens*, *Chironomus pseudothummi* and *Endochironomus albipennis*. One species of Chaoborid, *Chaoborus flavicans* and one Ephemeropteran, *Cloëon simile* were also important in the catches. Only small numbers of Trichoptera were taken in the traps. Four species *Polycentropus flavomaculatus*; *Polycentropus irroratus*; *Holocentropus picicornis* (all three free-living caddis) and *Limnephilus marmoratus* (a cased form) exceeded fifty individuals per lake per season.

The dominant species, with total numbers taken per species, for each lake are shown in Table 4.

Table 4. Summary of the dominant species in each lake.

Lough Avaul	<i>Chaoborus flavicans</i> (1,766) <i>Microtendipes pedellus</i> (203) <i>Cloëon simile</i> (109)
Lough Aderry	<i>Limnochironomus nervosus</i> (381) <i>Chaoborus flavicans</i> (368) <i>Microtendipes pedellus</i> (359) <i>Cloëon simile</i> (200)
Kilbreen Lake	<i>Pentapedilum sordens</i> (396) <i>Chaoborus flavicans</i> (371) <i>Endochironomus albipennis</i> (246)
Lough Reenydonegan	<i>Pentapedilum sordens</i> (2,483) <i>Chironomus pseudothummi</i> (430) <i>Endochironomus albipennis</i> (189)

The dominant species are compared as percentage frequency distributions against time for each lake (Figs. 2 to 5).

C. flavicans, the dominant species in Lough Avaul commenced emergence towards the end of May and reached its peak in early July. This peak coincided with the maximum temperature (60°F), recorded for the lake. The second and third dominants exhibited a roughly similar pattern (Fig. 2).

The dominant species in Lough Aderry was *L. nervosus* which had a sharply demarcated emergence period, mid-May to mid-June. *C. flavicans* was present in the collections from the beginning of June until mid-October. Two emergence peaks were evident. *M. pedellus*, with peak emergence in September, was present from mid-July onwards. *C. simile* showed a similar trend, maximum emergence in mid-September (Fig. 3).

In Kilbreen Lake, *P. sordens* was the dominant species. A maximum emergence was evident towards the end of June. A subsidiary mode appeared in mid-August, which coincided with the peak density of *E. albipennis*. *C. flavicans* was taken by the traps from May to mid-September, with a peak emergence in early June. There did not appear to be a correlation between temperature and peak emergence of any of the three species under review (Fig. 4).

In terms of numbers present, *P. sordens* was the commonest chironomid found in Lough Reenydonegan. It was present in the catches from early June to the end of October. Peak emergence periods occurred in June and September. *C. pseudothummi* was not taken until early July when a high emergence rate was observed. High numbers were also taken in August and September (Fig. 5).

Species which occurred in two or more lakes are now compared thus enabling seasonal fluctuations and emergence patterns to be compared. The inter-lake comparison is shown in Table 5.

Table 5. Species which occurred in appreciable numbers in more than one lake.

Loughs Avaul, Aderry and Kilbrean	<i>Chaoborus flavicans</i>
Loughs Avaul and Aderry	<i>Cloëon simile</i> <i>Microtendipes pedellus</i>
Loughs Kilbrean and Reenydonegan	<i>Pentapedilum sordens</i> <i>Endochironomus albipennis</i>

C. flavicans was the only species to occur in appreciable numbers in three of the lakes. The actual numbers taken are plotted against time for these lakes (Fig. 6). In Lough Avaul this species appeared to reach a density which was greater by more than a factor of five than that of the other two lakes.

The emergence distributions of *C. simile* are compared in Loughs Avaul and Aderry (Fig. 7). Trap catches were highest in August in Lough Avaul which was early compared to Lough Aderry where highest catches were taken in September. A similar comparison is made for *M. pedellus* from both lakes. Peak hatch occurred in the first half of August in Lough Avaul. In Lough Aderry, however, only a minor hatch occurred at this time. The main hatch took place in mid-September (Fig. 7). These facts seem rather strange in view of the temperature differences shown by the two lakes (Figs. 2 and 3). Lough Aderry has a much higher temperature range than Lough Avaul, yet the emergence periods are later for the two species in question.

The situation in regard to *Cloëon simile* in Loughs Avaul and Aderry is different from that in the large limestone lakes of the West, (Loughs Corrib, Mask, Conn), where this species was continuously present in collections made some years ago over the period mid-April to October, with peaks of abundance between mid-April and mid-May and again in August and September (Kennedy pers. comm.). If there is a substantial spring emergence of *C. simile* in Loughs Avaul and Aderry, the trapping may have begun too late to demonstrate it.

Two further species *P. sordens* and *E. albipennis* are compared for Kilbrean Lake and Lough Reenydonegan. The peak emergence periods for both species in each lake were identical (Fig. 8).

DISCUSSION:

The lakes under review have a number of features in common.

All four lie outside the limestone drift and may be described as small, shallow lakes which lack exposed shorelines. Water movement and water turn-over are negligible because the affluent and effluent streams are very small or absent.

Differences in depth occur between the four lakes although all of them are essentially shallow. The maximum depths recorded are :— 2 metres in Lough Aderry and 14 metres in Lough Avaul. Vegetation and type of plant species present also vary, being more plentiful in Loughs Aderry and Reenydonegan. Heavy growth of *Potamogeton pectinatus* L. in Lough Reenydonegan hinders shore angling. As already stated, Reenydonegan is passing through a change from brackish to freshwater conditions, which explains the persistence of some brackish water crustaceans and insects.

Gledhill (1958) has questioned the suitability of emergence traps when a species list is the objective of a particular investigation. He has shown, over a seven year period, that emergence traps failed to capture approximately 50% of the available species of Ephemeroptera, Plecoptera and Trichoptera in Ford Wood Beck. Mackereth (1957), working in the same area, had a similar experience with two commonly occurring Plecoptera.

Apart from the possibility that different species of lake insects may vary in their liability to be captured in emergence traps, the number of traps used in any of the four small Irish lakes investigated was too small in

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relation to the areas of the lakes to catch a fully representative cross-section of the insects present. Some species known to occur in some of the four lakes were not taken by the traps, e.g. *Leptophlebia vespertina* which is present in Lough Avaul and Kilbreen Lake and *Cloëon dipterum* which occurs in Lough Aderry (Kennedy pers. comm.). All that could be expected from the limited sampling programme was that it would give an indication of the general pattern of insect emergence in the lakes concerned.

There are, it would seem, few flies of angling importance in the lakes under survey, apart from the Ephemeroptera and Trichoptera, whose members are well known to anglers as duns and sedges. Some chironomid species do occur which may be of importance. *Endochironomus albipennis*, which was recorded in Loughs Reenydonegan and Kilbreen, is known to anglers as the apple green midge and forms an important item of trout diet in Midland lakes such as Lough Ennell. In Lough Reenydonegan, *Chironomus pseudothummi* occurs in relatively large numbers and could be classified in anglers' terms as a duck fly, because this term is applied to several species within the genus *Chironomus*. Other chironomid species, such as *Microtendipes pedellus* and *Pentapeditum sordens* (Table 4) are large enough to be of angling interest but it is not known if they are of importance in the trout diet in the lakes investigated. Where *Chaoborus* spp. are abundant, the larvae are often fairly important as trout food, and they have been recorded from the stomachs of trout from Lough Avaul. The adults appear to be eaten much less frequently; since they emerge mainly at night their angling importance would, in any event, be small (Kennedy, pers. comm.).

SUMMARY:

1. Emergence trap data taken from four small lakes in the south-western region of Ireland were examined to ascertain distribution, emergence periods and seasonal fluctuations in numbers of insects present.
2. The traps captured 51 species of Chironomidae, 1 species of Chaoboridae, 1 species of Ephemeroptera and 19 species of Trichoptera.
3. Only 5 species of Chironomids were present in significant numbers, *Microtendipes pedellus*, *Limnochironomus nervosus*, *Pentapeditum sordens*, *Chironomus pseudothummi* and *Endochironomus albipennis*.
4. The only species of Chaoborid taken in appreciable numbers was *Chaoborus flavicans*.
5. The only species of Ephemeroptera taken was *Cloëon simile*.
6. Four species of Trichoptera were taken namely *Polycentropus flavomaculatus*, *Polycentropus irroratus*, *Polycentropus picicornis* and *Limnephilus marmoratus*.
7. Dominant species which occurred in two or more lakes were also compared.

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REFERENCES:

- Gledhill, T. (1960). The Ephemeroptera, Plecoptera and Trichoptera caught by emergence traps in two streams during 1958. *Hydrobiologia* 15, 179-199.
- Mackereth, J. C. (1957). Notes on the Plecoptera from a stony stream. *J. Anim. Ecol.* 26, 343-351.
- Mundie, J. H. (1956). Emergence traps for aquatic insects. *Mitt. int. Ver. Limnol.* 7, 1-13.

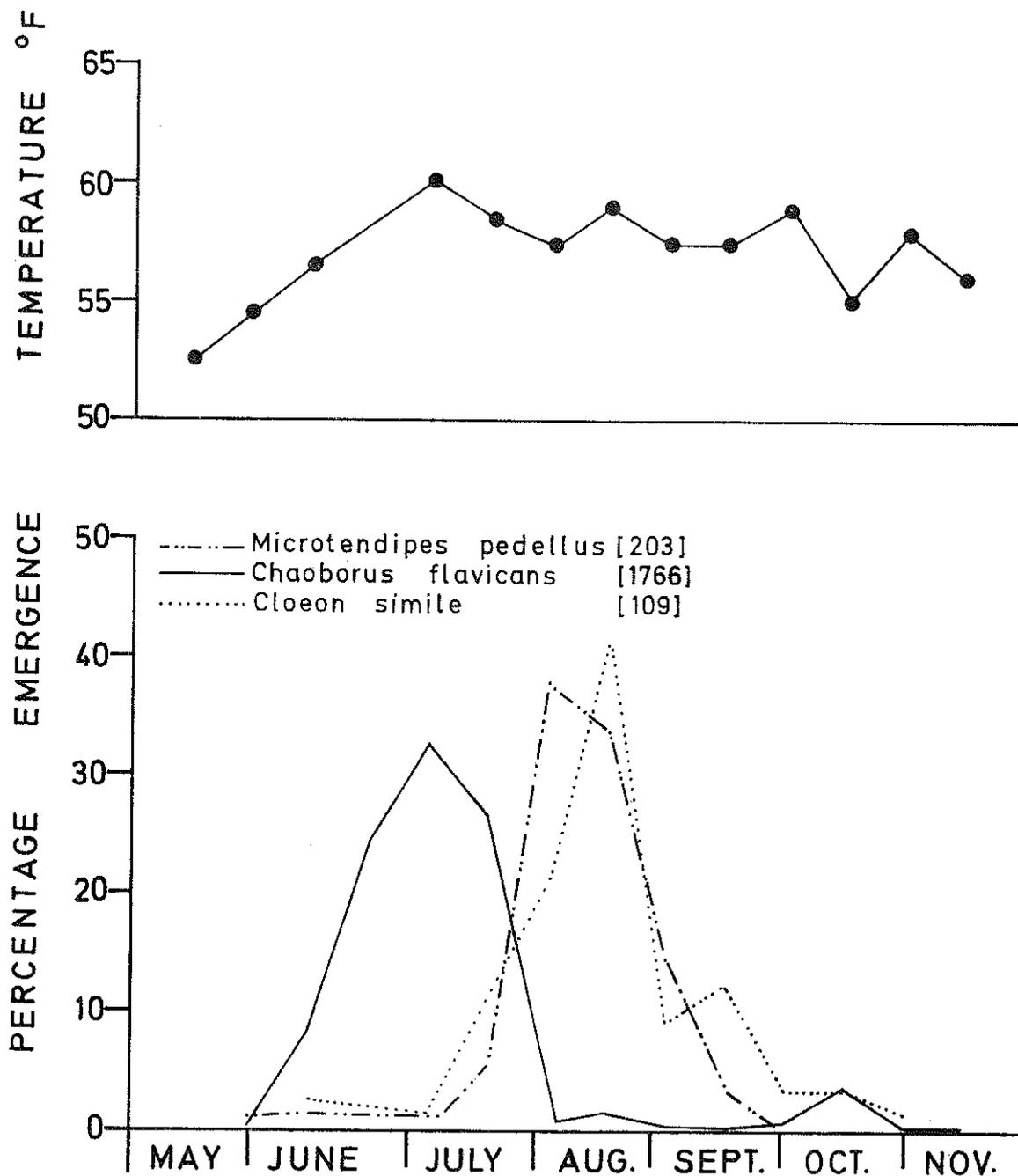


Fig. 2. Distribution, peak emergence periods and total numbers of the three dominant species in Lough Avaul. The temperature indicated in this and subsequent figures are the mean water temperatures.

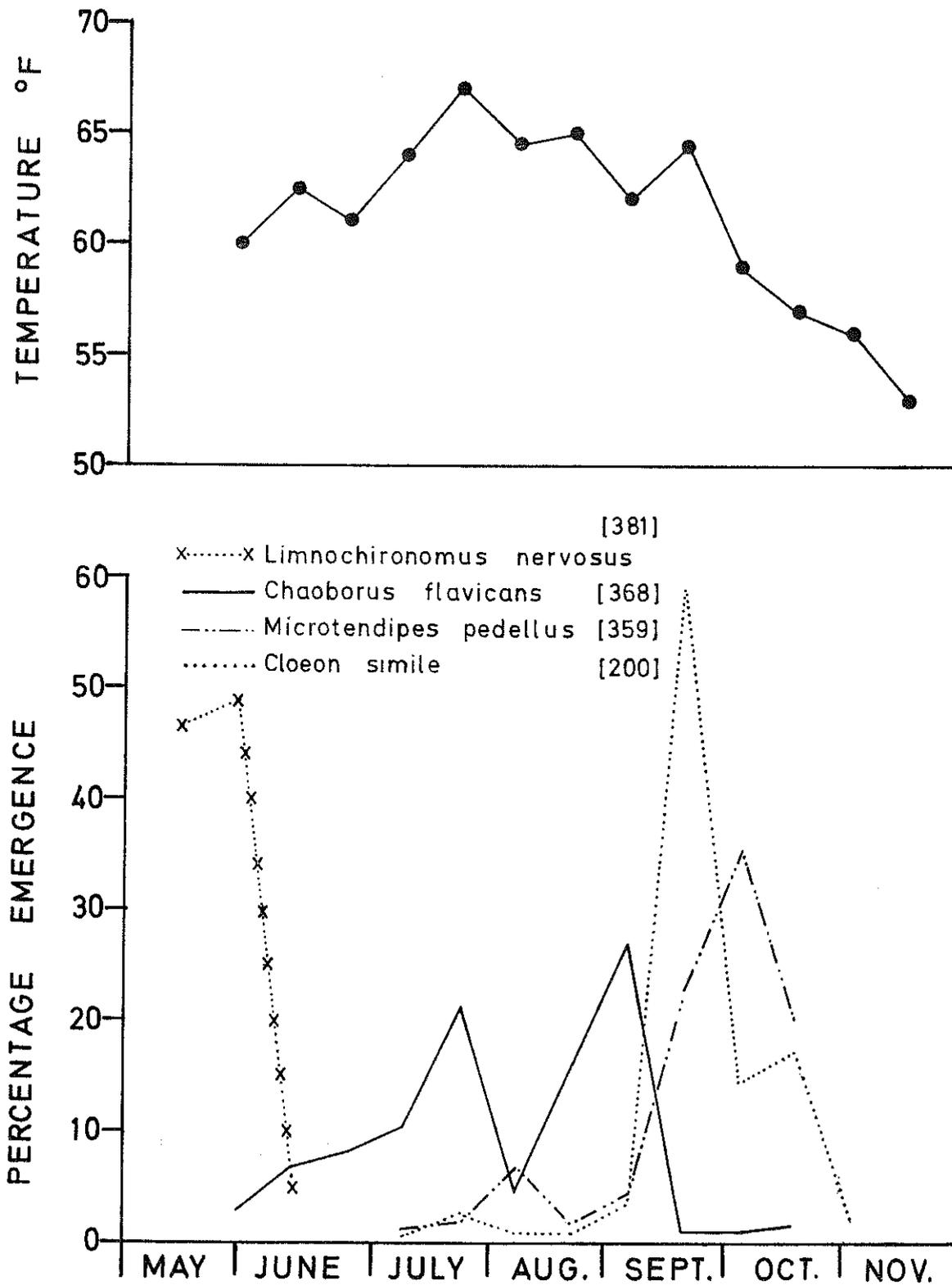


Fig. 3. Distribution, peak emergence periods and total numbers of the four dominant species in Lough Aderry.

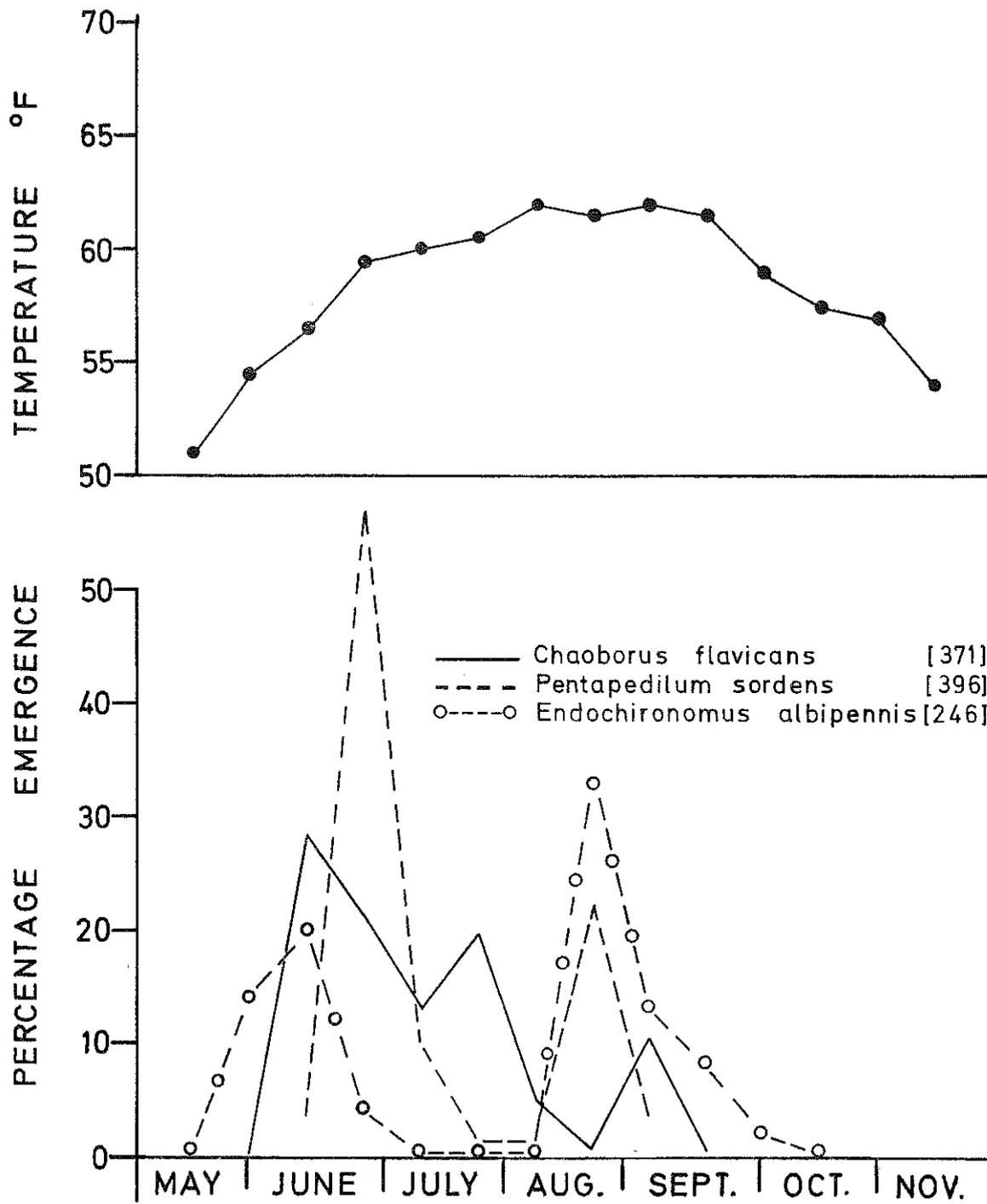


Fig. 4. Distribution, peak emergence periods and total numbers of the three dominant species in Kilbrean Lake.

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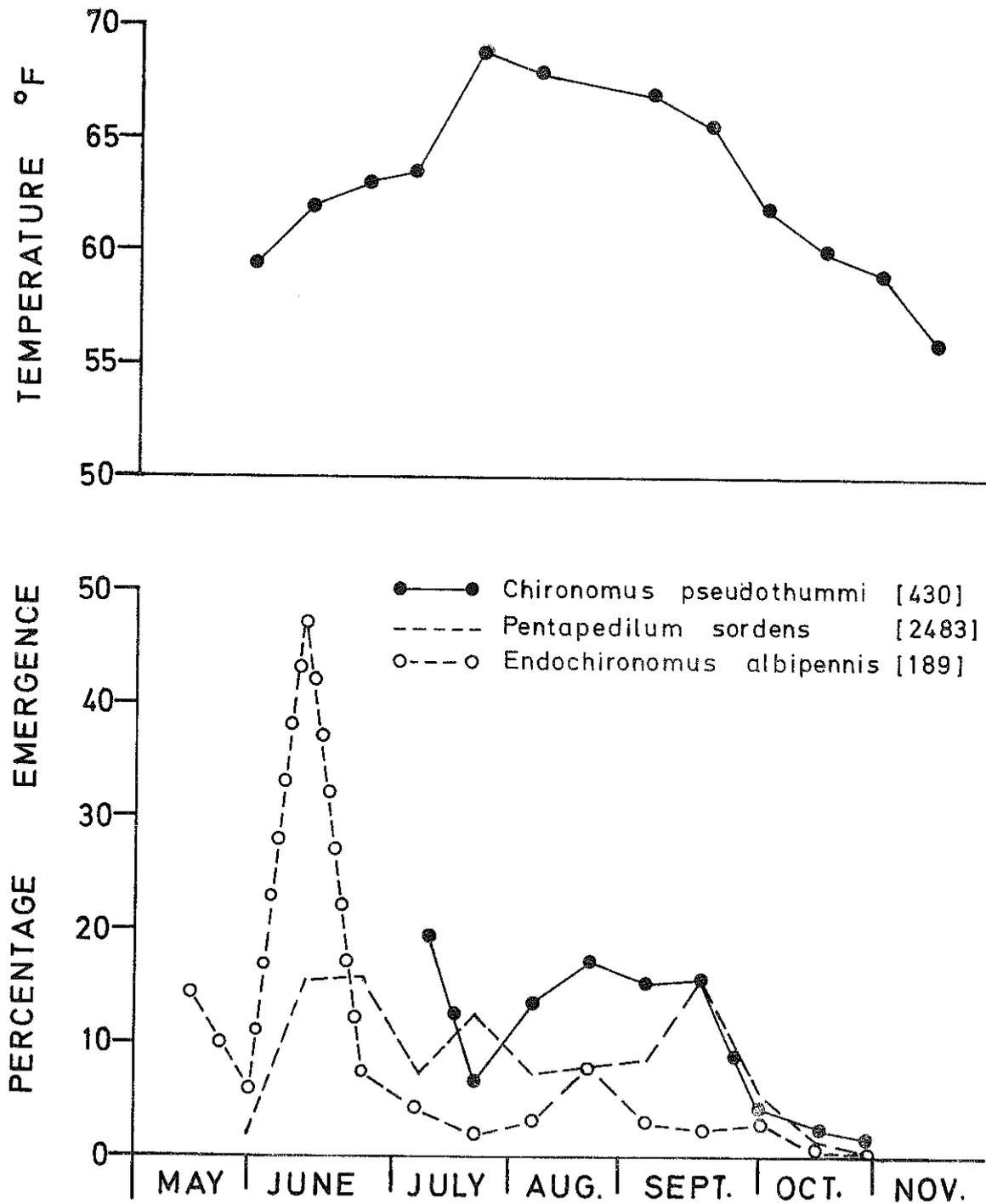


Fig. 5. Distribution, peak emergence periods and total numbers of the three dominant species in Lough Reenydonegan.

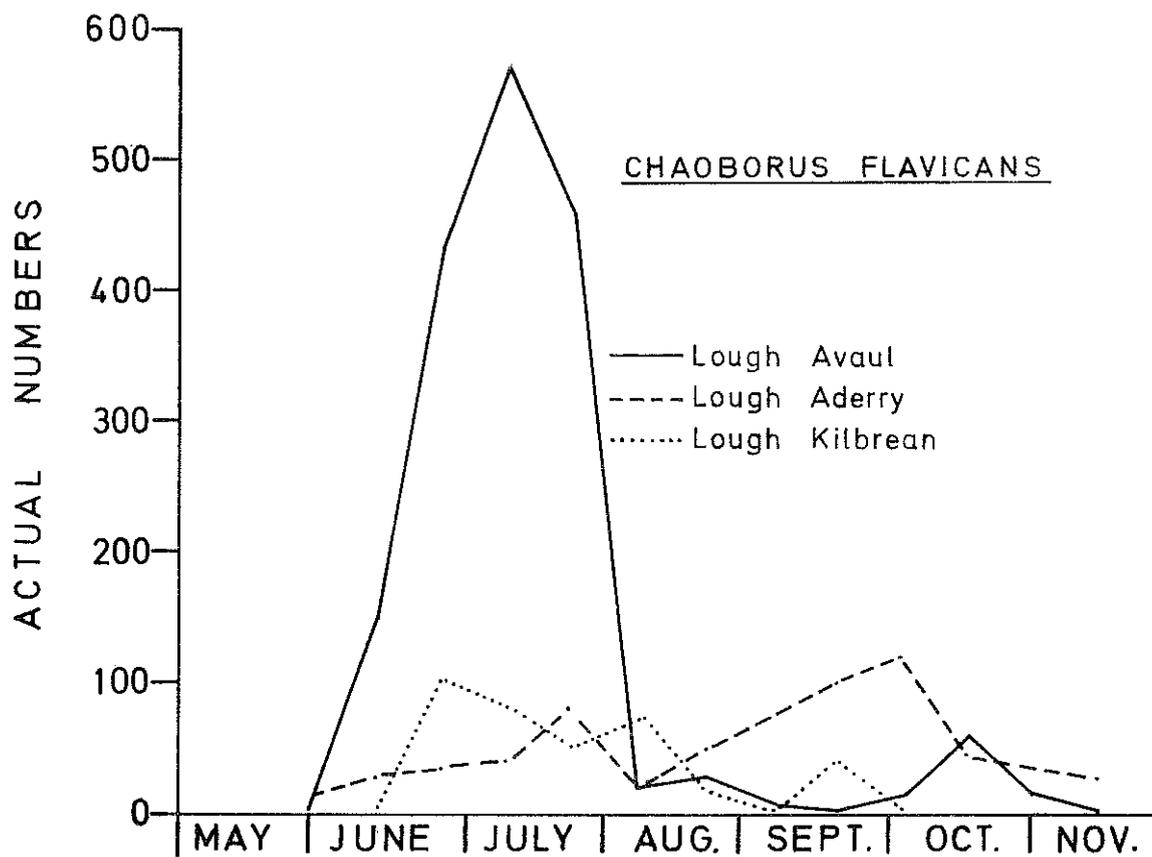


Fig. 6. Comparison of *Chaoborus flavicans* in three of the lakes under review.

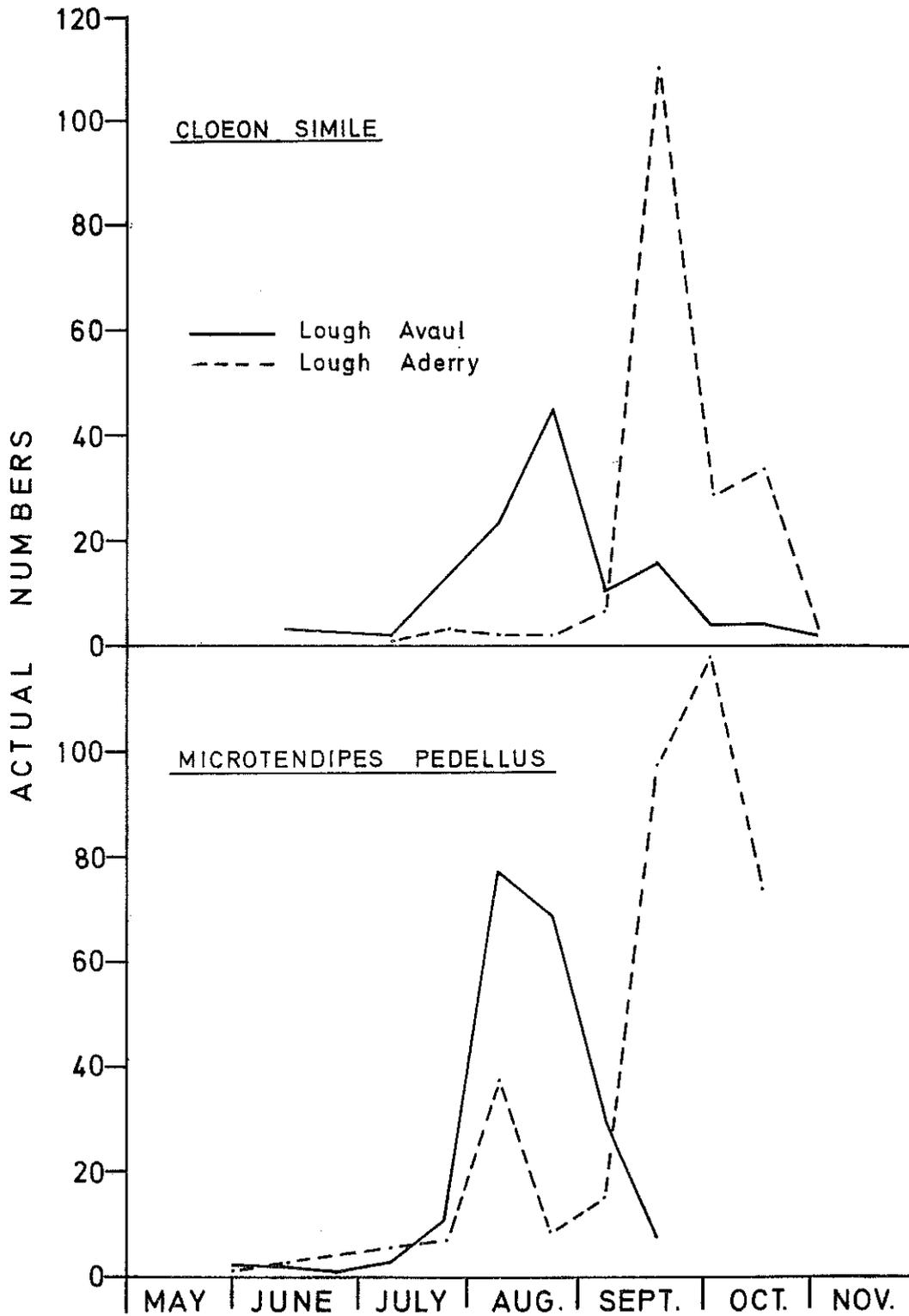


Fig. 7. Comparison of emergence peaks for *C. simile* and *M. pedellus* in Loughs Avaul and Aderry.

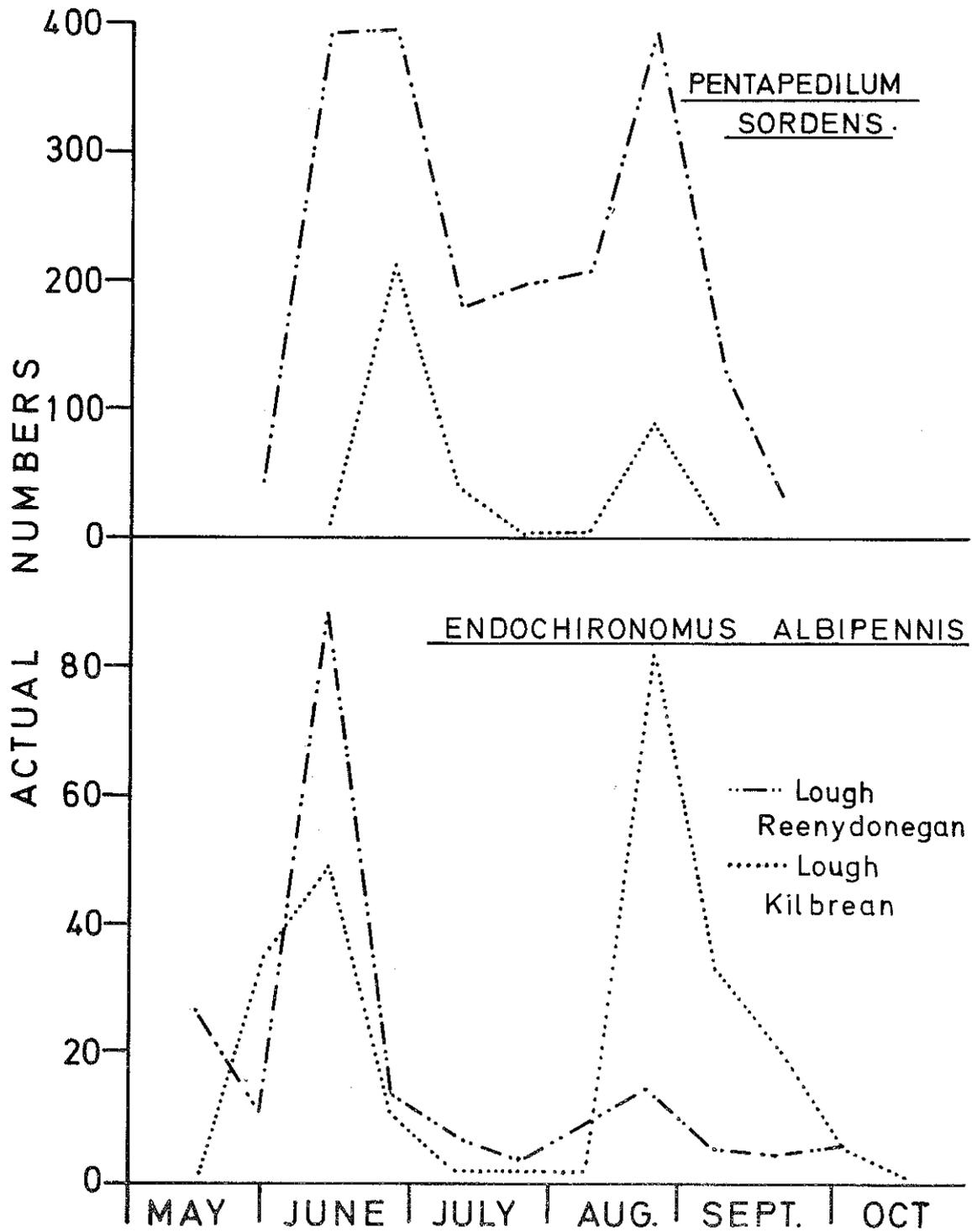


Fig. 8. Comparison of peak emergence of *Pentapedilum sordens* and *Endochironomus albipennis* in Loughs Kilbreen and Reenydonegan.

Table 1. Details of the Lakes sampled

Lakes	Area (ha)	Elevation (m)	Alkalinity ⁽¹⁾	Conductivity ⁽²⁾	Geology	Flora	Fish
Lough Avaul	4.6	ca 100	0.35	78.5	Old Red Sandstone	<i>Phragmites</i> <i>Lobelia</i> <i>Juncus</i>	Brown trout (<i>Salmo trutta</i>) stocked 1949, 1952, 1953, 1954, 1955, 1956, 1957, 1961, 1963 and annually up to and including 1970.
Lough Aderry	11.8	30	0.7—0.75	120.5	Old Red Sandstone	<i>Myriophyllum</i> <i>Chara</i> <i>Menyanthes</i> <i>Ceratophyllum</i>	Originally held only rudd (<i>Scardinius erythrophthalmus</i>). Unfed brown trout fry stocked unsuccessfully on a few occasions. Treated with rotenone in 1961 and again in 1968. Rainbow trout (<i>Salmo gairdneri</i>) stocked 1954, 1955, 1961, 1963. Brown trout stocked 1963 to date.
Kilbrean Lake	4.7	ca 150	0.25	63.5	Millstone Grit, Flagstones and Coal Measures	<i>Lobelia</i>	Stocked with brown trout in 1940, 1950, 1957 to 1961 and again from 1963 to the present. Rainbows stocked 1957 to 1964.
Lough Reenydonegan	25	Sea level	0.9 to 1.2	Slightly brackish water (Salinity 0.5‰)	Avonian Shales and Carboniferous Limestone	<i>Potamogeton pectinatus</i> , <i>Phragmites</i>	Stocked with rainbow trout in 1960. Brown trout stocked in 1963, 1965 and 1967 and each year subsequently.

(1) Alkalinity=bicarbonate alkalinity in mEq/l.

(2) Conductivity=conductivity in reciprocal megohms per cm³ at 20°C.

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Table 2. Location of Emergence traps

	Trap Number	Depth in Metres	Position in Lakes	Substratum	Plants Present
Lough Avaul	1	1	Littoral Area (NE End)	Peaty Mud	Close to <i>Phragmites</i> and <i>Equisetum</i> beds
	2	14	Lake Centre	Peaty Mud	None
	3	1	Shallow Bay (SW End)	Rocks, Stones and Sand	None
Lough Aderry	1	.75	Littoral Area (East End)	Mud	<i>Myriophyllum</i>
	2	.75	Littoral Area (West end)	Mud	<i>Isoetes</i>
Kilbrean Lake	1	1	Shallow Bay (West End)	Peaty Mud	Close to <i>Lobelia</i> sward
	2	.5	Shallow Bay (North End)	Mud	None
	3	5.5	Lake Centre	Mud	None
Lough Reenydonegan	1	2.5	Littoral Area (NE End)	Mud	None
	2	4.0	Lake Centre	Mud	None
	3	2.0	100 yds. from Sluice-Gate End	Mud	None

Table 3. Insects present in collections

Location:	Lough Avaul			Lough Aderry			Lough Kilbreen			Lough Reenydonegan		
	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period
<i>Procladius choreus</i> (Meig.)	19	11	19.5.69	124	21	27.8.69	—	—	—	13	12	19.5.69
<i>Procladius saggitalis</i> Kieff.	—	—	—	—	—	—	—	—	—	3	—	—
<i>Procladius simplicistilus</i> Freem.	—	—	—	—	—	—	—	—	—	9	—	—
<i>Procladius crassinervis</i> (Zett.)	—	—	—	—	—	—	3	—	—	—	—	—
<i>Psilotanypus ruffovittatus</i> (v. d. Wulp.)	2	—	—	7	—	—	—	—	—	—	—	—
<i>Ablabesmyia monilis</i> (Linn.)	—	—	—	49	20	4.6.69	—	—	—	—	—	—
<i>Ablabesmyia phatta</i> (Egg.)	—	—	—	17	13	4.6.69	—	—	—	—	—	—
<i>Zavrelimyia melanura</i> (Meig.)	—	—	—	6	—	—	—	—	—	—	—	—
<i>Psectrotanypus varius</i> (Fab.)	—	—	—	—	—	—	—	—	—	—	—	—
<i>Natarsia nugax</i> (Walk.)	—	—	—	—	—	—	78	25	8.9.69	—	—	—
<i>Psectrocladius sordidellus</i> (Zett.)	36	15	7.7.69	406	105	24.9.69	18	12	29.9.69	1091	584	26.5.69
<i>Psectrocladius barbimanus</i> Edw.	12	3	22.9.69	—	—	—	—	—	—	417	212	9.6.69
<i>Psectrocladius platypus</i> Edw.	—	—	—	2	—	—	—	—	—	—	—	—
<i>Cricotopus trifasciatus</i> (Panz.)	1	—	—	24	20	3.9.69	8	—	—	313	109	2.6.69
<i>Cricotopus tricinctus</i> (Meig.)	—	—	—	2	—	—	—	—	—	9	—	—
<i>Cricotopus sylvestris</i> (Fab.)	—	—	—	144	42	13.8.69	—	—	—	6	—	—
<i>Cricotopus bififormis</i> Edw.	—	—	—	—	—	—	6	—	—	—	—	—
<i>Cricotopus tibalis</i> (Meig.)	—	—	—	—	—	—	2	—	—	—	—	—
<i>Acricotopus lucidus</i> (Staeg.)	—	—	—	—	—	—	—	—	—	1	—	—
<i>Heterotanytarsus apicalis</i> (Kieff)	—	—	—	—	—	—	6	—	—	—	—	—
<i>Corynoneura</i> sp.	—	—	—	7	—	—	5076	1172	2.6.69	—	—	—
<i>Prodiamesa olivacea</i> (Meig.)	—	—	—	—	—	—	12	4	1.9.69	—	—	—
<i>Pseudodiamesa branickii</i> (Now.)	1	—	—	—	—	—	—	—	—	—	—	—
<i>Chironomus plumosus</i> Linn.	4	—	—	—	—	—	—	—	—	105	37	16.9.69
<i>Chironomus salinarius</i> Kieff.	—	—	—	—	—	—	—	—	—	19	12	19.5.69
<i>Chironomus pseudothummi</i> Str.	—	—	—	—	—	—	—	—	—	430	46	7.7.69 and 18.8.69
<i>Pseudochironomus prasinatus</i> (Staeg.)	42	23	15.7.69	141	133	27.8.69	—	—	—	—	—	—
<i>Graceus ambiguus</i> Goetgh.	28	11	16.6.69	—	—	—	—	—	—	—	—	—
<i>Cryptochironomus supplicans</i> (Meig.)	—	—	—	29	13	4.6.69	—	—	—	—	—	—
<i>Parachironomus baciliger</i> Kieff.	—	—	—	—	—	—	31	20	16.6.69	—	—	—
<i>Parachironomus pseudotener</i> Goetgh.	—	—	—	1	—	—	—	—	—	—	—	—
<i>Parachironomus monochromus</i> (v. d. Wulp.)	—	—	—	22	21	13.8.69	—	—	—	—	—	—
<i>Microtendipes pedellus</i> (de Geer)	203	43	10.8.69	359	99	24.9.69	56	25	11.8.69	82	23	30.6.69
<i>Microtendipes tarsalis</i> (Walk.)	—	—	—	—	—	—	2	—	—	—	—	—
<i>Microtendipes chloris</i> (Meig.)	—	—	—	—	—	—	1	—	—	—	—	—
<i>Glyptotendipes gripekoveni</i> Kieff.	4	—	—	—	—	—	—	—	—	53	19	15.7.69
<i>Glyptotendipes barbipes</i> (Staeg.)	—	—	—	1	—	—	—	—	—	—	—	—
<i>Glyptotendipes pallens</i> var. <i>glaucus</i> (Meig.)	—	—	—	—	—	—	71	49	9.6.69	—	—	—
<i>Glyptotendipes viridis</i> Macq.	6	—	—	—	—	—	—	—	—	—	—	—
<i>Limnochironomus nervosus</i> (Staeg.)	16	8	15.7.69	381	166	21.5.69	—	—	—	—	—	—
<i>Limnochironomus pulsus</i> Walk.	—	—	—	29	19	13.8.69	67	22	24.7.69	—	—	—
<i>Endochironomus albipennis</i> (Meig.)	12	6	18.8.69	—	—	—	246	44	11.8.69	189	54	2.6.69
<i>Endochironomus tendens</i> Fab.	76	75	8.9.69	—	—	—	—	—	—	—	—	—
<i>Polypedilum nubeculosum</i> (Meig.)	—	—	—	161	42	21.5.69	—	—	—	—	—	—
<i>Pentapedilum nubens</i> Edw.	22	12	1.9.69	4	—	—	3	—	—	6	—	—
<i>Pentapedilum sordens</i> (v. d. Wulp.)	31	27	16.9.69	21	20	3.9.69	396	222	16.6.69	2483	283	15.7.69
<i>Paracladopelma camptolabis</i> Kieff.	1	—	—	—	—	—	—	—	—	—	—	—
<i>Lauterborniella agryloides</i> Kieff.	—	—	—	110	57	4.6.69	—	—	—	—	—	—
<i>Microspectra subviridis</i> Goetgh.	114	58	19.5.69	—	—	—	—	—	—	—	—	—
<i>Tanytarsus gregarius</i> (Kieff.)	37	18	24.8.69	8	—	—	166	58	9.10.69	—	—	—
<i>Tanytarsus glabrescens</i> Edw.	—	—	—	855	381	21.5.69	—	—	—	—	—	—
<i>Cladotanytarsus mancus</i> (Walk.)	—	—	—	70	37	4.6.69	—	—	—	—	—	—

Table 3. (Contd.)

Location:	Lough Avaul			Lough Aderry			Lough Kilbreen			Lough Reenydonegan		
	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period	Total Nos. Taken	Max. No.	Emergence Peak Period
<i>Chaoborus flavicans</i> Meig.	1766	406	16.6.69	368	71	27.8.69	371	75	9.6.69	—	—	—
<i>Cloeon simile</i> Etn.	109	23	18.8.69	200	88	17.9.69	—	—	—	—	—	—
<i>Rhyacophila dorsalis</i> Curt.	24	—	—	—	—	—	—	—	—	—	—	—
<i>Rhyacophila munda</i> McLach.	2	—	—	—	—	—	—	—	—	—	—	—
<i>Polycentropus flavomaculatus</i> Pictet	89	35	1.9.69	—	—	—	—	—	—	—	—	—
<i>Polycentropus kingi</i> McLach.	2	—	—	—	—	—	—	—	—	—	—	—
<i>Polycentropus irroratus</i> Curt.	96	46	1.9.69	—	—	—	—	—	—	—	—	—
<i>Holocentropus picicornis</i> Steph.	53	20	18.8.69	12	7	3.9.69	42	18	4.8.69	—	—	—
<i>Agapetus ochripes</i> Curt.	1	—	—	—	—	—	—	—	—	1	—	—
<i>Tinodes waeneri</i> (L.)	7	—	—	—	—	—	8	—	—	6	—	—
<i>Phryganea grandis</i> L.	—	—	—	—	—	—	2	—	—	—	—	—
<i>Phryganea striata</i> (L.)	—	—	—	1	—	—	15	—	—	—	—	—
<i>Phryganea varia</i> Fab.	4	—	—	—	—	—	—	—	—	—	—	—
<i>Agrypnia pagetana</i> Curt.	3	—	—	—	—	—	—	—	—	—	—	—
<i>Limnephilus affinis</i> Curt.	2	—	—	—	—	—	—	—	—	—	—	—
<i>Limnephilus lunatus</i> Curt.	4	—	—	—	—	—	—	—	—	—	—	—
<i>Limnephilus politus</i> McLach.	4	—	—	—	—	—	—	—	—	—	—	—
<i>Limnephilus marmoratus</i> Curt.	—	—	—	—	—	—	65	22	26.8.69	—	—	—
<i>Grammotaulius atomarius</i> (Fab.)	4	—	—	—	—	—	—	—	—	—	—	—
<i>Oecetis lacustris</i> (Pictet)	11	—	—	—	—	—	25	—	—	—	—	—
<i>Oecetis ochracea</i> (Curt.)	—	—	—	15	8	3.9.69	—	—	—	1	—	—