response among the seven species that were studied may be due either to biochemical species differences or to differences in time of response.

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Quantitative Estimations of Populations of the River Crab, *Potamon* (*Potamonautes*) *perlatus* (M. Edw.), in Rhodesian Trout Streams

THE river crab is the largest invertebrate to occur in Rhodesian trout streams, but standard quantitative sampling methods reveal insignificant numbers of this animal. As has been suggested by Van Someren in Kenya[1], it is doubtful if anglers have been correct in assuming that the crab is an important trout-food item. Nevertheless, preliminary Rhodesian studies[2] indicate that it occurs in trout stomachs with a median percentage frequency occurrence of 13·1; furthermore, there is a 100·0 per cent frequency and 97·5 per cent volumetric occurrence in droppings of the clawless otter, *Aonyx capensis* Schinz. These figures are based upon slightly more than 1,000 stomach contents, and exactly 1,000 otter samples. In such circumstances the river crab takes on a certain economic standing, even if ignored as a competitor or scavenger.

The known Rhodesian habitat of *P. perlatus* (var. *inflatus*, *depressus*, *sidneyi*) can be described as mountain streams having an altitude ranging from 5,000 to some 6,800 ft. a.m.s.l. (1,520–2,070 m.), although the species may well be found both above and below these limits in addition to occurring in weirs or dams built upon the streams. In these waters the crabs can be taken in funnel-entrance traps baited with fresh fish, and if such traps are enclosed within a screened but typical section of stream then the number of animals captured decreases each time the traps are cleared. Thus it is possible to apply the population estimation method of De Lury[3], in which numbers of animals captured are plotted graphically against an ordinate, and total catch to date against an abscissa. Extrapolation of a fitted straight line to an intersection with the abscissa provides an estimation of the population present at that time. In practice, traps are cleared each 24 hr., and there is little difficulty in relating the results of test areas to the total area of stream-bed under consideration.

Chemical destruction of soft and hard parts of adult crabs suggests that the wet weight of soft parts represents but about 34·0 per cent of total wet weight. In assessing populations as potential fish or otter food this factor should be taken into account. It may be recalled that Allen[4] treated the mollusc *Potamopyrgus* in similar fashion, although that worker dealt with dry weights.

Trapping is selective in that small specimens having a maximum carapace width of less than 17·0 mm. are not attracted to baits so far tested. However, the larger size groups consistently taken in traps can usefully be discarded when taken in orthodox net or dredge samples. In impoverished African trout waters the occurrence of a single large crab can have a grossly distorting effect upon the collection, and when such large-size animals appear it is an asset to be able to ignore their occurrence. The small-size group, in Rhodesian trout streams being less than 17·0 mm. carapace width, have less distorting effect and may be incorporated in orthodox sampling results. During practical field work it is therefore suggested that trapping forms a valuable adjunct to a series of dredge and net samples, provided that the degree of selectivity is determined and allowed for.

Preliminary results at Inyanga, the main trout area of Central Africa and having a central point at about 32° 44′ E., 18° 17′ S., indicate that *perlatus* specimens subject to trapping range from 17·3 to 45·0 mm. maximum carapace width. The range for males is 22·0–45·0 mm., and that for females 17·3–37·5 mm. The median wet weight of all specimens taken, after drying-off of all surplus moisture, ranges from 7·375 to 10·510 gm. There is some evidence that smaller size groups pertain where other trout food organisms are in poor supply; but in these areas the crabs are infested with a small greenish leech, normally some 10·0 mm. in length when extended, and customarily found at the bases of the legs. To date no phoresic associations with the crabs have been detected, such as the phoresis between *Potamon niloticus* and immature stages of *Simulium neavei*, and between a crab species and *S. nyasalandicum*[5]. Calculated populations of river crabs in Rhodesian trout streams range from 3,049 to 5,227 per acre (7,530–12,910 per hectare). The wet weight per acre ranges from 49·5 to 121·2 lb. (55·5–135·8 kgm. per hectare), and the wet flesh weight from approximately 16·82 to 41·2 lb. per acre (about 18·86–46·15 kgm. per hectare).

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A Temperature-dependent Endogenous Rhythm in the Rate of Carbon Dioxide Output of *Periplaneta americana*

Ball, Dyke and Wilkins[1] and Wilkins[2] developed an apparatus, incorporating an infra-red gas analyser (Grubb-Parsons, *S.B.*1), for continuously estimating the rate of carbon dioxide metabolism of plant tissue maintained under constant external conditions for 5–10 days. Using this apparatus the rate of carbon dioxide output of individual adult cockroaches was