Natural history and development of the introduced signal crayfish, Pacifastacus leniusculus, in a small, isolated Finnish lake, from 1968 to 1993

Signal crayfish (Pacifastacus leniusculus) originating from Lake Tahoe, California, were introduced into Karisjärvi, a small (11 ha) lake in central Finland (61° 58'N, 25° 32'E), in 1968 and 1969. Since then, the population has been monitored regularly by trap catches. The stocked signals (3–5 years old) were caught until 1973, by which time they had reached ages of 7–9 years. Catches have increased slowly since the early 1980s, the peak occurring in 1991 at 2.0 individuals per trap per night. The population size was estimated as 60 trappable specimens in 1974, 95 in 1981 and 420 in 1988. The mean density of adult population in suitable biotopes was low, 0.07 specimens per m–2, or 0.3 per shore metre, in 1988. The slow development of the P. leniusculus population has been attributed to environmental factors, mainly the limited area of good crayfish habitat. More than 90 % of all signal crayfish were caught in one-third of the shore area, i.e. in steeply sloping lake beds suitable for burrowing or rich in shelters such as rocks and submerged trees. The signals avoided flat, soft bottoms. Fifty per cent of the female P. leniusculus matured at 90 mm TL (smallest 64 mm), i.e. half of the females entered the breeding population in the autumn of their fourth year. The mean size of newly hatched (stage 2) juveniles was 9.7 mm TL and of one-summer olds 30.3 mm. The largest specimen trapped measured 159 mm. The signal crayfish imported into Finland and stocked were infected with crayfish plague (Aphanomyces astaci), but no mortality has been recorded. Two Branchiobdellidae (Annelida, oligochaeta) epibiont species new to Finland were imported from North America with P. leniusculus. The continuous occurrence of these commensals in the signal crayfish population indicates that they have adapted to Finnish conditions.

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