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# A NOTE ON THE *JAERA ALBIFRONS* GROUP OF SPECIES (ISOPODA, ASELLOTA) IN OSLOFJORD

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(One figure in the text)

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The isopod *Jaera albifrons* LEACH was divided into four distinctive subspecies by FORSMAN (1949), viz. *J. a. albifrons, J. a. ischiosetosa, J. a. praehirsuta* and *J. a. posthirsuta,* to which BOCQUET (1950) described two additional subspecies, viz. *J. a. syei* and *J. a. forsmanni.* BOCQUET (1954) later elevated *J. albifrons* to a superspecies, but retained the trinominal specific names. These subspecies, however, with the exception of *J. a. syei,* have recently been regarded as distinct, sympatric species (HAAHTELA 1965, NAYLOR & HAAHTELA 1966 and 1967). The geographic and ecological distribution of the species within the *Jaera albifrons* group have been an object for many studies in the last years, and information has been published from France (BOCQUET 1953), Britain (NAYLOR et al. 1961, NAYLOR & HAAHTELA 1966), Netherland (van REINE-DE JAGER 1966), Germany (GRUNER 1962 and 1965), and from Sweden and the Baltics (FORSMAN 1944, 1945 and 1956, HAAHTELA 1965, NAYLOR & HAAHTELA 1967). Observations from Norway are sparse, and previously notes on the geographical distribution have been given by FORSMAN (1949) and BRATTEGARD (1966), and there is an ecological note by HUSSEY (1964).

In the present paper remarks on the distribution in outer Oslofjord will be given together with comparisons of previous knowledge of the ecological preferences of the species.

## MATERIAL AND METHODS

The material examined consists of 2,706 specimens, of which 587 are males, collected from 27 localities in outer Oslofjord, SE Norway, in May to August 1965 and 1966. It originates mostly from samples taken for purposes other than *Jaera* collecting, and is thus only qualitative. Most samples were obtained at the water's edge on the upper shore (always above MTL), but there are also some from rock pools. Samples have been taken from amongst algae, under stones and from beds of small *Mytilus edulis.*

The material was identified by diagnoses given by BOCQUET (1953), GRUNER (1965), and HAAHTELA (1965), and the binominal nomenclature proposed by HAAHTELA (1965) and NAYLOR & HAAHTELA (1966 and 1967) is followed.

## THE SPECIES, SEX RATIO AND SIZE

As Table I shows, three species were found in the material, viz. *J. albifrons*, *J. ischiosetosa* and *J. praehirsuta*, of which the two first-mentioned have previously been reported from Dröbak in the inner part of the fjord (FORSMAN 1949). No specimen of the typical brackish water form *J. a. syei* was recognized, and only a single male showed characters intergrade between the typical *J. albifrons* and *J. a. syei*.

Table I. Length in mm of male *Jaera* species from Oslofjord.

| | n | average length | extremes |
|---|---|---|---|
| *J. albifrons* | 68 | 1.65 | 1.1 – 2.3 |
| *J. ischiosetosa* | 499 | 1.80 | 1.1 – 2.85 |
| *J. praehirsuta* | 8 | 1.65 | 1.5 – 1.85 |

The sex ratio in the present material is 1 : 3.6, while the ratio found in Hardangerfjord was 1 : 2.9 (BRATTEGARD 1966 p. 15), and that in Olderfjord 1 : 6.5 (HUSSEY 1964, Tab. I). From the recent paper of NAYLOR & HAAHTELA (1967), the sex ratio in their Baltic material can be calculated as 1 : 3.3, which corroborates that found in Oslofjord, and that reported by NAYLOR et al. (1961) — 1 : 3.3 — from Britain. These last propose that the low proportion of males is a result of the chromosonal complications in the *Jaera albifrons* group, which were pointed out by STAIGER & BOCQUET (1954 and 1956).

The males of the three species did not differ much in size, which is also pointed out by HAAHTELA (1965). The average length (from the anterior margin of the head to the posterior margin of the pleotelson) and extremes are given in Table I. Particular variations between males from different habitats could not be found. GRUNER (1962) reports the maximum length of males within the *Jaera albifrons* group as 3 mm, and NAYLOR et al. (1961) found the average for 10 males to be 1.7 mm. A hundred and four specimens of *J. ischiosetosa* from the Baltic in August averaged 1.7 mm, while *J. praehirsuta* in January averaged 2.1 mm (n=6) and in August 1.7 mm (n=8) (HAAHTELA 1965). Since a new generation of small animals will be found in the spring, which increases in size towards the autumn, when the population will represent a group uniform in size (FORSMAN 1944, HAAHTELA 1965), the measurements from Oslofjord will possibly not be representative of the autumn-population, which may average a larger size.

## ECOLOGICAL PREFERENCE

*J. ischiosetosa* was commonly found both amongst algae and under stones, and was far more numerous than the other species (Tab. II). The preference of this species for the upper shore (HAAHTELA 1965, NAYLOR & HAAHTELA 1966 and 1967) may explain its large number in comparison to the other species. The occurrence of this species amongst algae in Oslofjord, however, is surprising, since previous investigations have

Table II. Summarized results on the occurrence of *Jaera* species in different microhabitats and different exposed shores in Oslofjord. A: number of records. B: number of specimens.

| | HABITAT | | | | | | WAVE EXPOSURE | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | amongst algae | | under stones | | amongst *Mytilus* | | small | | medium | | heavy | |
| | A | B | A | B | A | B | A | B | A | B | A | B |
| *J. albifrons*... | 4 | 9 | 4 | 20 | 7 | 45 | 5 | 26 | 6 | 14 | 4 | 34 |
| *J. ischiosetosa* | 10 | 128 | 8 | 336 | 3 | 41 | 8 | 298 | 12 | 194 | 1 | 10 |
| *J. praehirsuta* | 1 | 1 | 1 | 1 | 3 | 6 | 2 | 2 | 1 | 4 | 2 | 2 |

shown that it has a preference for stones (FORSMAN 1949 and 1956, BOCQUET 1953, NAYLOR & HAAHTELA 1966 and 1967). This species occured with about equal frequency in localities with small and medium wave exposure, and was only once recorded in a locality with heavy wave exposure (Tab. II). This corroborates previous findings elsewhere (loc.cit.).

*J. albifrons* was mostly recorded amongst *Mytilus* close to MTL, but was also common under stones (Tab. II). BOCQUET (1953 and 1954) and HUSSEY (1964) recorded this species exclusively from under stones, while NAYLOR & HAAHTELA (1966) found that it occurred both amongst algae and under stones. The latter showed, however, that a preference for stones was present. This species is reported to be most abundant on shores with a certain degree of wave exposure (FORSMAN 1949, NAYLOR & HAAHTELA 1967). In the Oslofjord it was about evenly recorded in localities with small, medium and heavy exposure (Tab. II).

Although the records of *J. praehirsuta* are very few, this species was found in all three habitats and on localities of different wave exposure (Tab. II). FORSMAN (1949) and BOCQUET (1953 and 1954) report this species exclusively from algae, while NAYLOR & HAAHTELA (1966 and 1967) found that it had a preference for algae, but recorded it also under stones, particularly on the upper shore. This species seems to occur mostly on sheltered shores (loc.cit.), but FORSMAN (1949) also reports it from exposed localities. The sparse records of the species in Oslofjord is obviously a cause of the lack of samples from the lower shore.

The occurrence of all species, and *J. albifrons* in particular, among *Mytilus* in Oslofjord suggests that this habitat should be considered in ecological studies of the *Jaera albifrons* group.

Of the nine samples from rock pools, all located on shores with some exposure, *J. albifrons* was present in two and *J. ischiosetosa* in eight

respectively. They were found amongst algae, except in two samples where *J. ischiosetosa* occurred under stones only. The two species are previously noted amongst algae in rock pools in the Baltic and the former also in rock pools on exposed marine shores (FORSMAN 1949 and 1951). *Jaera* species are also found in rock pools in Britain, and it is suggested that *Jaera* changes its habitat from stones to algae possibly to avoid stagnant conditions beneath stones (NAYLOR & SLINN 1958).

## DISTRIBUTION IN OSLOFJORD

The distribution of the species in Oslofjord is mapped in Fig. 1. On the eastern side of the fjord *J. ischiosetosa* was the only species in five of the localities, while only one *J. albifrons* was present in each of the last two, found together with 61 and 24 *J. ischiosetosa* respectively. Among the

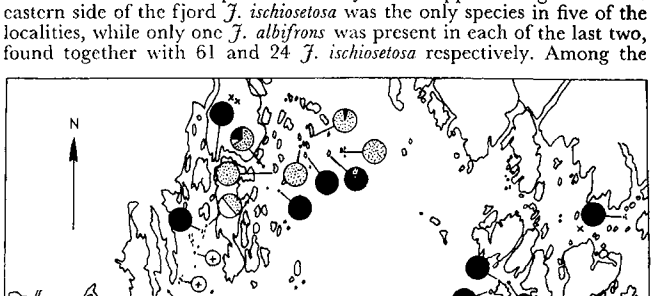


Fig. 1. The distribution of species within the *Jaera albifrons* group in outer Oslofjord. The composition of species in each locality is given by the circle sectors. ⊗ *J. albifrons*, ● *J. ischiosetosa*, ○ *J. prachirsuta*, ⊕ females only x ; 1 *J. albifrons* present, xx ; 3 *J. albifrons* present.

16 localities on the western side of the fjord where males were present, *J. ischiosetosa* occurred alone in five localities, but dominated in three more. *J. albifrons* occurred alone in only three localities and dominated in three more. *J. prachirsuta* was recorded as single species once.

All species occurred together in two samples, and two species occurred together on seven of the microhabitats investigated in Oslofjord. The fact that species of the *Jaera albifrons* group often occur together, and usually without interbreeding, in the same microhabitat, is one of the reasons mentioned by NAYLOR & HAAHTELA (1966 and 1967) for regarding them as distinct species.

The distribution of the species in Oslofjord seems to differ from the eastern to the western side. It could be expected that the flowage in

spring and early summer of the large river Glomma, which has its outlet just north of the localities on the eastern side, causes variations in the surface salinity, which only the most euryhaline species, viz. *J. ischiosetosa*, could tolerate. But SUNDENE (1953) has shown that the variations in surface salinity are approximately equal on both sides. Salinities less than 15 ‰ are not found in the areas, and all species are shown to tolerate salinities down to 6 ‰ (NAYLOR & HAAHTELA 1967 p. 23). No explanation of these peculiar distribution patterns can be given at the moment.

## SUMMARY

Sex ratio, size of males, ecological preferences and distribution in outer Oslofjord, SE Norway, of the *Jaera albifrons* group are given, based on an examination of 2,706 specimens from 27 localities in the area. Three species, viz. *Jaera albifrons*, *J. ischiosetosa* and *J. praehirsuta*, were found. The sex ratio of the superspecies and the size of males of the species corroborate those previously reported elsewhere. The ecological preferences of the species showed some patterns different from previous results, and beds of small *Mytilus edulis* are reported to be an important microhabitat for the species in the area investigated. Differences in the distribution patterns are reported from each side of the fjord.

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