

Investigations into the little known and under-recorded isopod genus *Jaera*

by David Fenwick

I have for a while been interested in isopods but have only recently found the time to check the status of members of this genus in Cornwall. I started by reading the section on *Jaera* in Synopses of the British Fauna "Intertidal Marine Isopods" by Ernest Naylor and Angelika Brandt and looked at Cornish records on the ERICA database. There were 26 records of *Jaera albifrons*, one for *J. forsmani*, one for *J. prae-hirsuta* and three for *J. nordmanni*. There were no records for *Jaera ischiosetosa* on ERICA. On looking at the records it appeared that there is probably a disproportionate amount of records for *Jaera albifrons*, now used as a collective name for a group of four species.

Looking at the highly detailed photographs that I'd taken in the past of *Jaera* to see if I could identify the species in the images. I was shocked that the only species that could be identified from detailed images was *J. nordmanni*, all the rest of the images I could only assign to the *Jaera albifrons* group, and many images were of the larger females of the group. This means that *J. nordmanni*, that any species included in the *Jaera albifrons* group can only be verified from images if they are taken using a microscope. I've since found as a result of this brief study that details of habitat cannot be used to assist with species identification either and because all four species can be found together!

Jaera albifrons was divided by Forsman in 1949 into three distinct species; a fourth, *Jaera forsmani* was described by Bocquet in 1950 and named to honour Forsman. Thus, the *Jaera albifrons* group in the UK, is a now group of four species. Members of the *Jaera albifrons* group include *Jaera albifrons*, *J. forsmani*, *J. prae-hirsuta* and *J. ischiosetosa*. The species *Jaera nordmanni* is a distinct species and not part of the group, it does not share the same shaped praeoperculum as members of the *J. albifrons* group.

The purpose of this article is mainly to report the differences between the species in the *Jaera albifrons* group and to assist in the collection of higher value data, *Jaera* sp. being acceptable for the purpose of recording, but in nearly 70 years we don't seem to have gotten away from recording of *J. albifrons* for members of the group.

Jaera nordmanni



I decided that a fresh start was needed. I already knew that *Jaera* could be abundant at certain sites, so I decided to sample and collect specimens to look at them in more detail. I started by collecting *Jaera* that were found on rocks with wet bottoms, or those that fringed shallow pools in the middleshore, getting the *Jaera* off the rocks by washing them in a bucket of seawater, retrieving the *Jaera* using a small plastic sieve. This method was later improved, and I found I didn't need to look for *Jaera* on the bottom of rocks and small stones to get a good sample, I'd just pick up a suitable rock and wash it in a bucket before replacing it in the same position it came from, this saved time on visually looking for them. All sites chosen were quite sheltered in terms of wave-exposure.

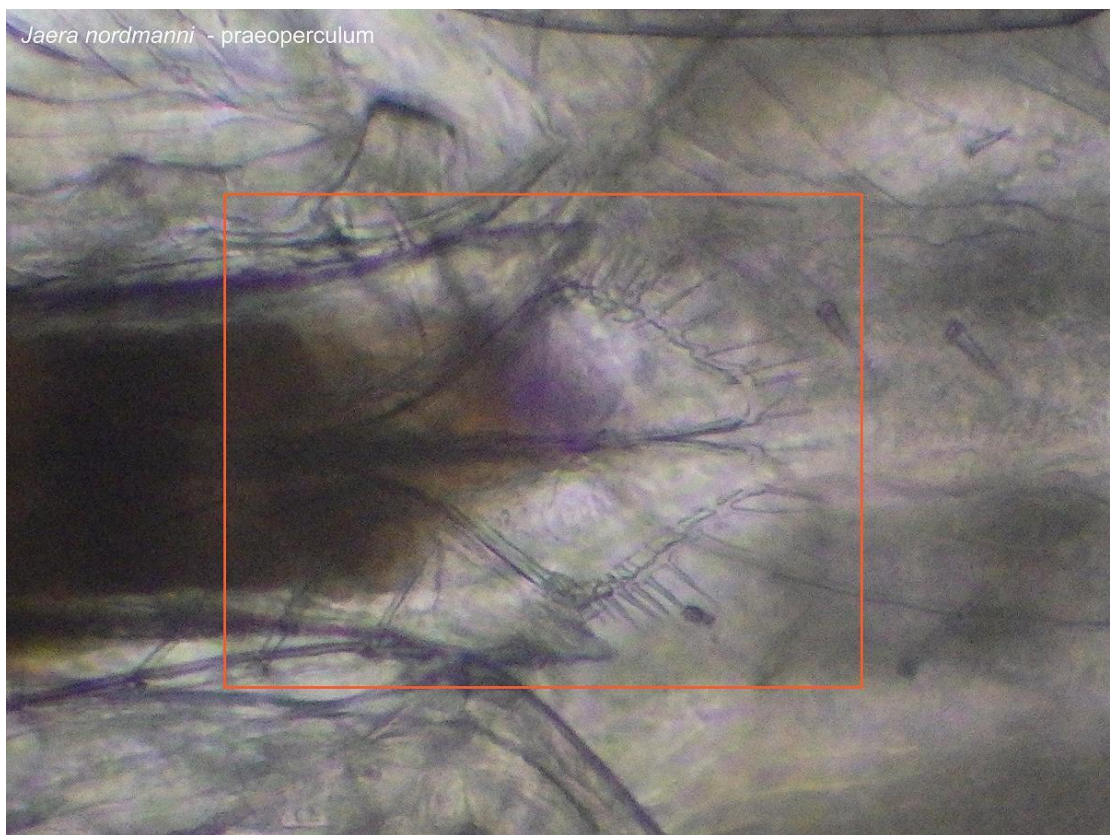
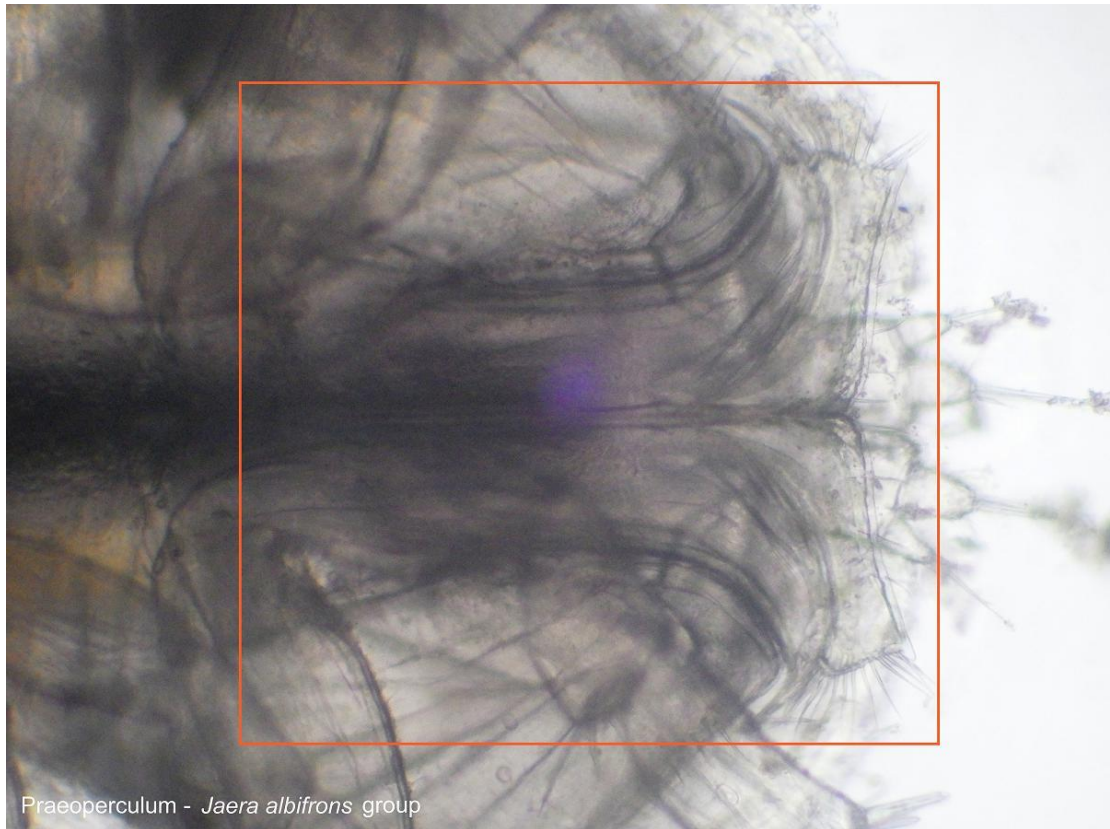
A good sample is needed, ideally over 20 specimens, I say this because at Hannafore, Looe, I collected about 20 specimens only to find all were female. Females cannot be used to identify the species, it is only the males that are useful. Males can be separated from females visually, they are usually smaller and darker than the females, but juvenile females require a stereomicroscope to sort them. In any one sample, there will likely be more females than males, and many of the females collected were berried and will have either eggs or developing young in their brood pouch, and it is best practice to return females to the sea as soon as possible because they are not needed. A greenish tint can usually be seen on the dorsal surface of sexually mature females, which is the colour of the eggs and developing young.

Once males have been isolated, one can then start looking at specimens using a compound microscope at magnification of x100. A small number of male specimens can be checked at the same time by placing individuals in a drop of seawater on a microscope slide, a small cover slip is usually enough to immobilize animals without harm, the slide is then inverted and the pereopods on the ventral side of the animals studied. For a larger number of specimens, it is advisable to dispatch specimens in

ethanol then place them on a slide, turning specimens on their backs using a fine acupuncture needle, and adding a cover-slip to help splay the pereopods.



Males of the species within the *Jaera albifrons* group are defined by the shape of the praeoperculum, this is located at the ventral posterior of the animal, under the telson, this is often described as “T- shaped”, but I think of it as looking rather like an old-fashioned moustache. *Jaera nordmanni* has a much different praeoperculum but it is a species that could appear in samples because it often occurs with members of the *Jaera albifrons* group, and because the species can tolerate low levels of salinity.



Top: praeoperculum *Jaera albifrons* group. Bottom: *Jaera nordmanni*

If a male specimen has a praeoperculum as seen in the *J. albifrons* group, then pereopods 1-2 (legs, front) and 6-7 (legs, rear) must be looked at to determine the species. The position of setae, the sparsity of curved setae, number and position of spines, and the shape of parts that make up the pereopod (carpus, propodus, ischium and merus) is used to determine the species. The figures below show the notable differences between the pereopods of the species within the *albifrons* group.



In early December 2017 *Jaera forsmani* was identified in a sample of washings taken from a rock crevice at Little London, Marazion, Cornwall. It was the finding of this species that encouraged me to look for other species of the genus.

Little London reef, Marazion.



Jaera forsmanni habitat

In January 2018, a sample was collected from under stones next to where a stream flows down the shore, at Wherry Town, Penzance, Cornwall. Males were examined, and all were found to be *Jaera ischiosetosa*, a species not listed on the Cornish ERICA database. This species was found to be abundant at the site, and at other sites where water flows down the shore, at one site on the River Fal it was found to be superabundant.



In late January, 2018, a friend sent me a *Jaera* from Poole Harbour, Dorset, which I identified as *Jaera albifrons* sensu stricto. A few days later while washing stones from pools under the bridge that crosses Penzance Harbour, I also found *Jaera albifrons* sensu stricto myself. This species also occurs at Restronguet Passage in large numbers.



In early February, 2018, during a visit to Hannafore, Cornwall, I took a sample from the same site where I had previously collected 20 females. The site is beside the storm drain, where a stream runs down the shore. Males were collected, and these were identified as *Jaera ischiosetosa*. *Jaera ischiosetosa* was also found to occur on the lowershore at Hannafore.

Numerous other sites were examined around Penzance, Cornwall and the most common species was without any doubt *Jaera ischiosetosa*, although it must be noted that collection was a result of stone-washing and not from weed-washing. Weed-washing at different levels of the shore may give different results with other species found to be equally abundant. I use the words "equally abundant" because *Jaera* individuals are not rare, they are actually very common indeed. It's only their small size that probably puts people off recording them, males are smaller than females and are only around 2 mm in length, so specimens need to be taken away from the shore to be identified using a microscope.

There was just one record for *Jaera praehirsuta* on the ERICA database, it was found at Restronguet Passage, Mylor Bridge, near Penryn, Cornwall in September 1990, no other *Jaera* being recorded as being present at this site at that time. It was clear that if I were to find and photograph this species in detail that this should be my starting point. On 22 February 2018 I had to visit the Tremough Campus of Exeter University at Penryn, so I decided to go on to Restronguet Passage after the visit to look for *Jaera praehirsuta*. The same technique was used to collect specimens, the washing or small rocks and stones, anything less than 3/4 diameter of a bucket was considered, some stones had fucoid algae attached. On straining the sample, it was easy to see that numerous individuals had been collected and that *Jaera* specimens were potentially superabundant at the collection site which was just in front of the Pandora Inn. A lot

of time was spent in the laboratory separating males from females visually, and then juvenile females removed from the males using a stereomicroscope. Males were then turned on to their backs using a fine acupuncture needle and their pereopods examined using a compound microscope. I was surprised to find *Jaera ischiosetosa* and *Jaera albifrons* dominating the sample, and only a single *Jaera forsmani* was also found, I had to sort through nearly all the male specimens collected before finding *Jaera praehirsuta*, which probably represented approximately 2% of the entire sample. More importantly, however, all four species of the *Jaera albifrons* group were found at this location. Re-finding a single species like *Jaera praehirsuta* is one thing but finding all four species together in a sample means that one cannot guarantee how many species a sample will contain where-ever it is collected. On determining the first specimen one should not assume that all the rest will be the same, a lot more patience is required.



It appears a lot needs to be done to record this common but overlooked genus successfully, and we really need to look closely at specimens from areas such as the Fal, Camel, Helford, Lynher, Tamar and East Looe rivers. We need to look in brackish pools on and above high water, in freshwater streams running down the shore, in estuaries and fully saline areas of sheltered coasts to get a better picture of the distribution of the species. Although in estuaries and probably some very sheltered shores it is likely all will occur together, like at Restronguet Passage.

Jaera can be found on algae such as Serrated Wrack, *Fucus serratus* (*Jaera praehirsuta*); and Bladder Wrack, *Fucus vesiculosus* (*Jaera albifrons* s.s), but specimens can be found in the same zones under pebbles, stones or rocks with damp / wet bottoms. It is easier to wash stones than to cut and wash algae and is by far less

destructive. In essence, *Jaera* is a bit like barnacles, and like barnacles, species of *Jaera* tend to have a preference for different zones on the shore, although it would seem that this is not an absolute rule.

One species not dealt with here is *Jaera hopeana* Costa, 1853, which I have never seen, it has been found living as an ectocommensal on the isopod *Sphaeroma serratum*. It has occurred at Wembury in Devon since the 1930s, it should therefore be looked for in Cornwall especially towards the east of the county.

Conclusion

Members of the genus *Jaera* are particularly easy to collect and commonly occur on the shore in wet areas, in areas of either freshwater or seawater seepage.

The reason why they are not recorded more often is due to the fact that *Jaera* cannot reliably be identified in-situ on the shore, although sexing individuals may be possible with a magnifying glass, loupe or head magnifier and some experience. Specimens really need to be taken away, sorted, and examined under a microscope/s. The process of identification is therefore complex and beyond the scope of Citizen Scientists / recorders who do not possess microscopes, but this should not prohibit their collection and sending to people who can identify them.

In terms of identification, verification, photography, only male specimens should be used, good images of the praeoperculum is a primary consideration, this would prove if a specimen was in the *J. albifrons* group or not. If within the *J. albifrons* group then pereopods 6 and or 7 are important for *J. forsmanni*, *J. ischiosetosa* and *J. albifrons*; pereopods 1 and 2 are important for the determination of *Jaera praehirsuta*. In some examples of *J. ischiosetosa* the setae on pereopod 7 had worn off, they were found to be in better condition and easier to see on pereopod 6.

To get microscope images for validation, pereopods need to be carefully dissected from the specimen, placed on a slide, covered with a cover slip and photographed, making sure that the setae on the pereopod are in focus and their position obvious.

A quick guide to *Jaera* pereopods

J. nordmanni - Oval shaped body, praeoperculum parallel sided, acutely pointed.

J. albifrons group - praeoperculum T / stalked moustache shaped.

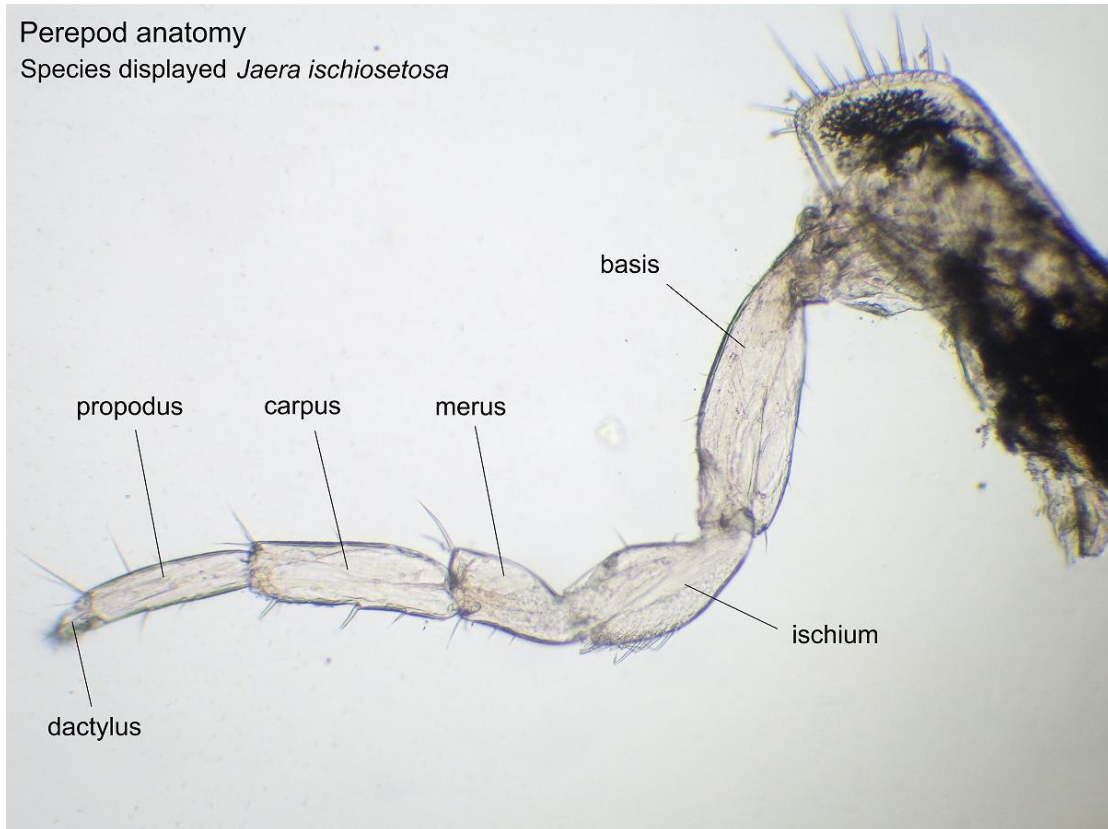
J. praehirsuta - Pereopods 1-4 with curved setae on propodus, carpus and merus.

J. albifrons - Pereopods 6 and 7, distal region of carpus with spined lobe.

J. ischiosetosa - Pereopods 6 and 7, curved setae on the distal portion of the ischium.

J. forsmanni - Pereopods 1-4 are sparsely covered with curved setae on the propus, carpus and merus segments; pereopods 6 and 7 have well developed carpal spines.

Perepod anatomy
Species displayed *Jaera ischiosetosa*

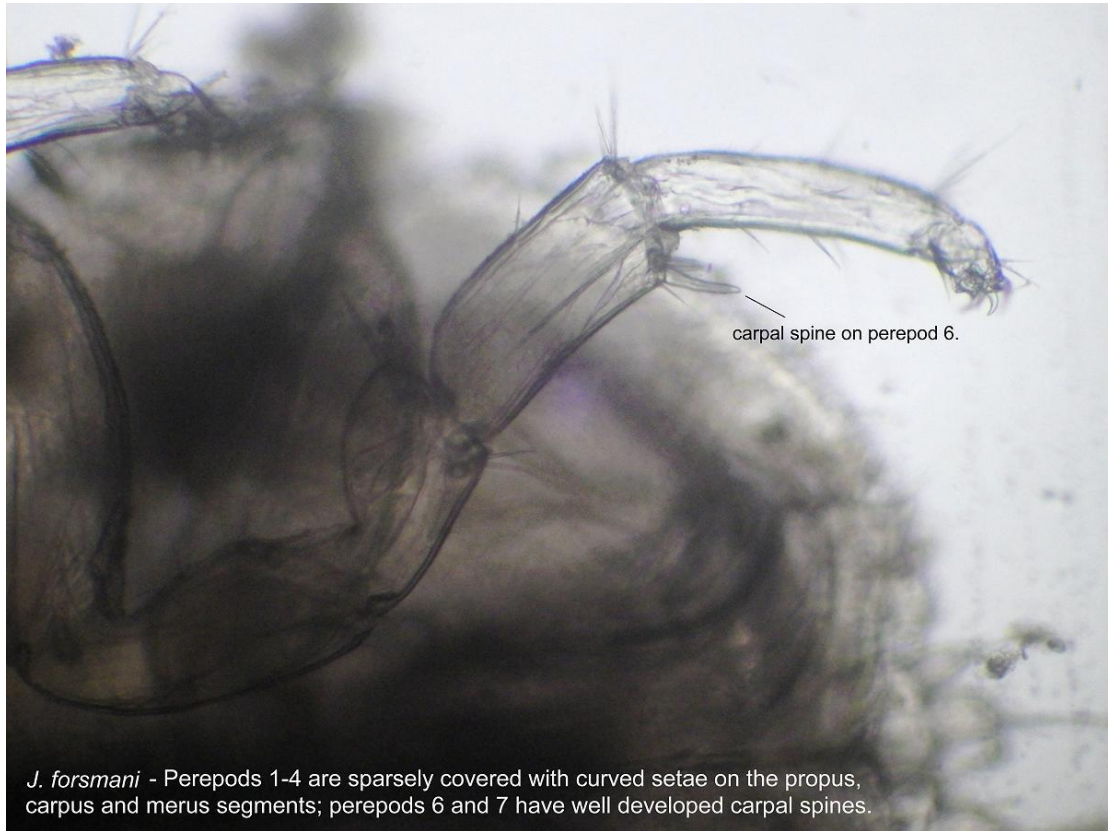


Perepod anatomy



Jaera albifrons - Pereopods 6 and 7, distal region of carpus with spined lobe.

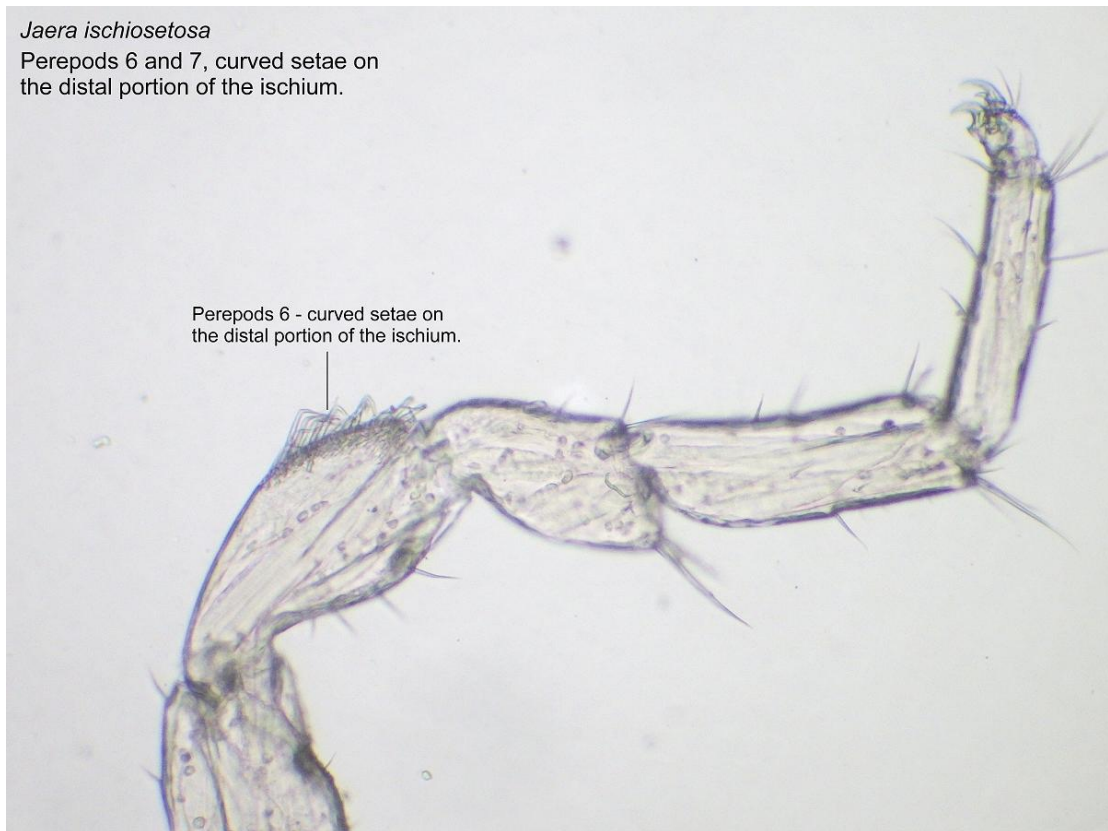
Jaera albifrons pereopod 6



Jaera forsmanni pereopod 6



Jaera forsmanni pereopods-1-2



Jaera ischiosetosa pereopod-6



Jaera praeirsuta pereopod 2

References used:

E.Naylor and A. Brandt. Synopses of the British Fauna, "Intertidal Marine Isopods"
Haywood and Ryland. Handbook of the Marine Fauna of North-west Europe.

Bocquet, C. (1950) Le probleme taxonomique des *Jaera marina* (Fabr.) (*J. albifrons*
Leach). Comptes rendus hebdomadaires des Seances de l'Academie des Sciences,
Paris 230:132-134.

ERICA Database

Online resources

APHOTOMARINE - <http://www.aphotomarine.com/isopoda.html>

Marine Species Identification Portal, Macroenthos of the North Sea - Crustacea
http://speciesidentification.org/species.php?species_group=crustacea&menuentry=soorten&id=503&tab=beschrijving

WoRMS - <http://www.marinespecies.org/aphia.php?p=taxdetails&id=118364>

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