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Records and distribution of *Syscenus infelix* in the deep Mediterranean (Crustacea: Isopoda: Aegidae)

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The parasitic isopod *Syscenus infelix* is recorded from the Mediterranean, based on 19 specimens from a depth range of 375–2071 m. The first ovigerous female of the species is also recorded. Patterns of possible parasitism were suggested based on the depth distribution of *S. infelix*, and their possible host macrourid fish below 900 m depth in the Catalano-Balearic basin.

The present paper reports the occurrence of the parasitic aegid isopod crustacean *Syscenus infelix* Harger, 1881, in deep waters of the western Mediterranean, based on 19 captured specimens. Mann (1970) mentioned *S. infelix* occurring on gadoid fish from the Mediterranean. This record unfortunately was never confirmed due to lack of specimens, and the species has thus never formally been recorded from the Mediterranean Sea. A more recent citation records the remains of a specimen of *Syscenus* found in the stomach contents of the crab *Chaceon mediterraneus* at depths between 1941–2221 m (Cartes, 1993).

In the course of a study of the distribution of *Syscenus* species, 14 separate records of the species, represented by 19 specimens, from the Zoological Museum, University of Copenhagen (ZMUC), and from different cruises performed within the framework of projects conducted by the CSIC (Consejo Superior de Investigaciones Científicas) and the IEO (Instituto Español de Oceanografía) were documented. The ZMUC specimens were collected with midwater trawls (either young-fish trawls or Nansen closing nets), while CSIC/IEO specimens were collected with bottom trawls (excluding the ovigerous female which was collected with a 0.5-mm mesh size plankton net attached to an OTSB bottom trawl). Bottom trawls were equipped with codends of 6–10-mm mesh sizes. These records are presented below.

Family AEGIDAE
Genus *Syscenus* Harger, 1881
Syscenus infelix Harger, 1881

Material examined

CSIC, 1 female 27.8 mm, Bathos III Station 17, 40°45.8′N 1°55.4′E, Catalan Sea, north-western Mediterranean, 1434–1319 m, 4 July 1988.

CSIC, 2 males 20.5 mm, 22.8 mm, Bathos III Station 22, 40°05.8′N 2°04.9′E, Catalan Sea, north-western Mediterranean, 1631–1578 m, 6 July 1988.

CSIC, 2 males 21.9 mm, 24.3 mm, Bathos IV Station 4, 40°56.7′N 3°00.7′E, Catalan Sea, north-western Mediterranean, 2071–1880 m, 28 July 1988.

CSIC, 1 male 28.9 mm, Bathos V Station 2, 40°20.5′N 1°42.5′E, Catalan Sea, north-western Mediterranean, 1609–1562 m, 25 October 1988.

CSIC, 2 females 19.4 mm, 25.3 mm, Bathos V Station 8, 40°30.7′N 1°47.6′E, Catalan Sea, north-western Mediterranean, 1680–1575 m, 27 October 1988.

CSIC, 1 male 29.2 mm, Bathos V Station 11, 40°55.6′N 1°44.6′E, Catalan Sea, north-western Mediterranean, 1036–994 m, 28 October 1988.

CSIC, 1 male 29 mm, Bathos V Station 17, 41°07.5′N 2°27.3′E, Catalan Sea, north-western Mediterranean, 861–1100 m, 29 October 1988.

CSIC, 1 male 21 mm, 1 female 23.9 mm Bathos V Station 18, 41°02.9′N 2°35.9′E, Catalan Sea, north-western Mediterranean, 1524–1479 m, 29 October 1988.

CSIC, 1 female 24.3 mm, Station MEDITS-ESO 1, Station 12, 36°19.9′N 4°21.6′W, Alboran Sea, Mediterranean, 720 m.

CSIC, 1 ovigerous female 25.6 mm, QI Station 21, 38°29.1′N 1°48.4′E, south-western Eivissa, south-western Mediterranean, 809–823 m, 22 October 1996.

ZMUC, 1 juvenile 8.1 mm, Thor Station 204, Mediterranean, 38°52′N 7°43′E, 27 August 1910.

ZMUC, 2 juveniles 6.1 mm, 6.7 mm, Thor Station 99, Mediterranean, 36°02′N 5°16′W, 750 m, 24 June 1910.

ZMUC, 1 juvenile 10.0 mm, Thor Station 220, Mediterranean, 36°25′N 0°42′E, 375 m, 4 September 1910.

ZMUC, 1 juvenile 7.5 mm, Thor Station 14.1125, 41°24′N 17°15′E, 1000 m, 21 February 1908.

Remarks

The recorded material agrees well when compared with specimens from both eastern and western North Atlantic. The Mediterranean specimens also show the sexually dimorphic uropods characteristic of the species, with the endopod of the male having a shallow longitudinal groove on the dorsal surface, this groove being absent in the female.

From specimens collected in the western Mediterranean since 1988, the depth distribution of *Syscenus infelix* ranged between 722 and 2071 m. Juveniles were collected shallower (at 375 m) by the RV 'Thor' using midwater trawls (Schmidt, 1912). Some depth related trends were observed in

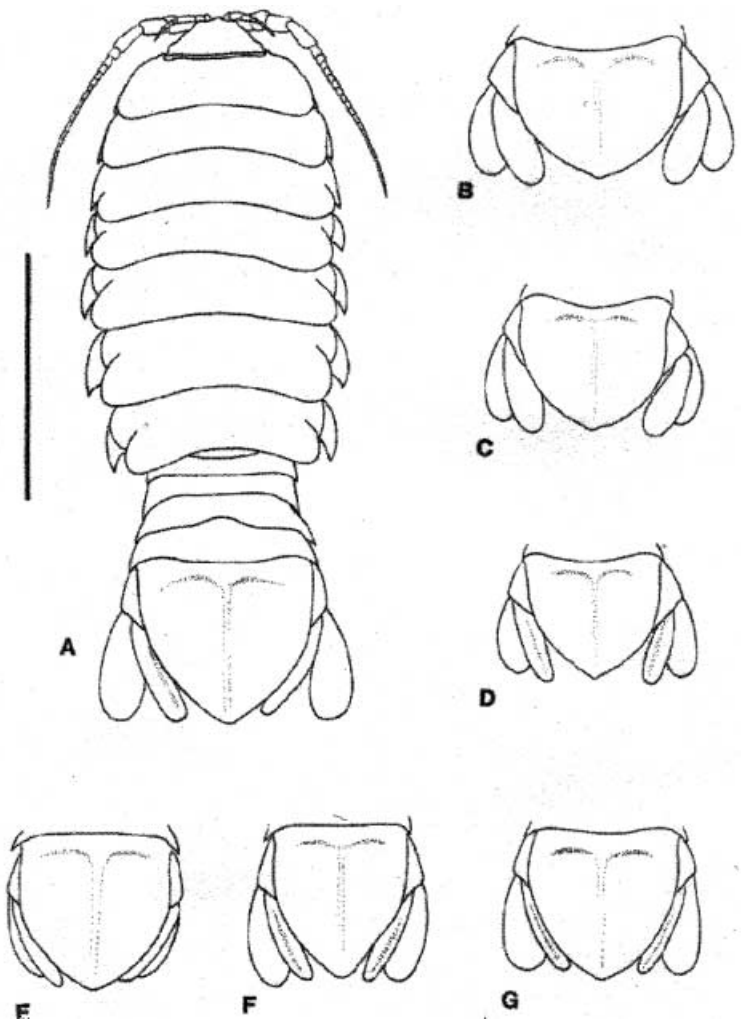

Figure 1. *Syscenus infelix* Harger, 1881. Specimens from the western Mediterranean. (A) Male in dorsal view, 29.2 mm; (B) pleotelson female 27.8 mm; (C) pleotelson female 23.9 mm; (D) pleotelson male 21.0 mm; (E) pleotelson of ovigerous female 25.6 mm; (F) pleotelson male 21.9 mm, right side injured; (G) pleotelson of male 24.3 mm. Scale bar: A, 10 mm.

our specimens of *Syscenus infelix* in the deep Mediterranean captured with bottom trawls during Bathos cruises, with a size increase with depth to around 1100 m where maximal sizes were attained (Figure 2). Juveniles, by contrast, were always distributed at shallower depths than bottom-collected adults, probably as a consequence of their presumably free-living life style (Ross et al., 2001).

Geographic distribution

Syscenus infelix was described from off Cape Cod, Massachusetts, USA, (Harger, 1881) and has since been recorded from both the eastern and western North Atlantic. In the Mediterranean, it was recorded in the Catalano-Balearic Basin and southern in the Algerian Basin (south-western Balearic Islands and the Alboran Sea near the Strait of Gibraltar) (Figure 3). Records of the species from Japan, the Philippines, New Caledonia, and South Africa are open to doubt.

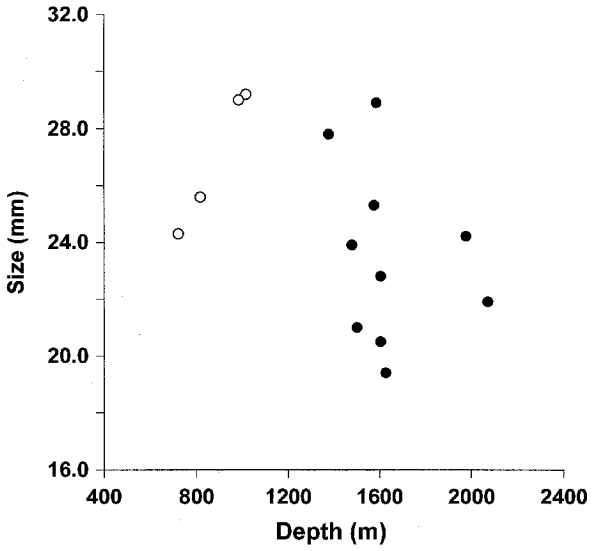

Figure 2. Size–depth distribution of specimens of *Syscenus infelix* Harger, 1881, collected by bottom trawling in the Mediterranean. (○) specimens with *Nezumia aequalis* as presumed host.

Many aegid species are parasitic on fish (Kensley & Schotte, 1989). *Syscenus infelix* has been recently cited as an external obligate parasite of the macrourid rattail *Nezumia bairdii* (Good & Bean), and it was observed attached to

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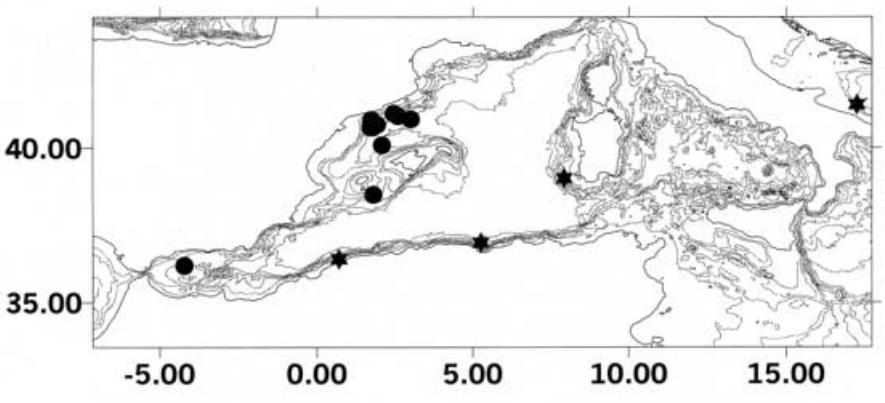

Figure 3. Distribution of specimens of *Syscenus infelix* in the Mediterranean. (●) Specimens collected with bottom trawls on CSIC/IEO cruises; (★) specimens collected with plankton nets on the 'Thor' cruises.

this species during submersible surveys performed along the north-western Atlantic continental slope (Ross et al., 2001). The attachment of isopods on other *Nezumia* species (e.g. *N. aequalis*) has also been reported as these attachments create characteristic scars situated in the dorsal midline behind the dorsal fin of the fish (Ross et al., 2001). In the western Mediterranean no direct observations nor scars were reported for any possible host fish. Our specimens were captured with bottom trawls where parasites and possible hosts could be separated by trawling disturbance. Recent analysis performed on *Nezumia aequalis* from the Alboran Sea (MEDITS 2001, and 2002 cruises) failed to find scars in the dorsal midline behind the dorsal fin (J. Cartes, personal observations).

Among *Nezumia* spp. cited as hosts of *S. infelix*, *N. aequalis* is the only species distributed and abundant in the western Mediterranean (Stefanescu et al., 1992). During the same cruises during which *S. infelix* was captured, *N. aequalis* was restricted to the middle slope reaching maximum depths of 1212 m, while the isopod was repeatedly captured beyond this depth to 2071 m. These results suggest other patterns in the life history or in the parasite–host relationships by *S. infelix* in the deep Mediterranean than that indicated from the north-west Atlantic. The depth–size distribution of *S. infelix* also seems consistent with the size distribution of its possible host. The increase in size with depth to 1200 m (Figure 2) is parallel to that of *N. aequalis*, which shows a marked bigger-deeper depth–size trend in the Catalan Sea between 862–1212 m. Below 1212 m, the maximum depth of occurrence of *N. aequalis* in the deep Mediterranean, the life style of *S. infelix* remains unclear. *Chalinura mediterranea* and *Coryphaenoides guentheri*, dominant macrourids similar in shape to *Nezumia aequalis* and occurring deeper than this species (at least to 2800 m: Geistdoerfer & Rannou, 1972) could be among other possible hosts of this isopod.

Syscenus infelix had a relatively high occurrence in our cruises (16.7% for Bathos cruises). However, the low number of specimens collected suggests much lower infestation rates than those cited for the north-west Atlantic area (16.6–23.7% for *N. bairdii*: Ross et al., 2001).

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