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NOTES ON DECAPOD FAUNA OF "ARCIPELAGO TOSCANO"

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Riassunto

Una serie di campionamenti effettuati principalmente nelle acque costiere di alcune isole dell' Arcipelago Toscano, ha accertato la presenza di 118 specie di crostacei decapodi. L' elenco viene riportato con alcune annotazioni ecologiche delle specie più interessanti.

Summary

The results of a preliminary investigation on the Decapod Crustacea of the Arcipelago Toscano are reported.

For the 118 collected species, some ecological features are discussed, chiefly about cave communities and species living associated with others sessile invertebrates.

Introduction

The area considered, located between the Ligurian Sea on the north and the Tirrenian Sea on the south, includes the islands of Gorgona, Capraia, Elba, Pianosa, Montecristo, Giglio, Giannutri and some less important reefs. These are all set on the continental shelf surrounded by deep waters in front of the coasts of Toscana, and therefore have quite homogeneous characteristics.

As I had the opportunity to report in a previous work on the Decapoda of Giglio island (in press), this area although particularly interesting, appears to be scantily investigated. Moreover, recently, the human and industrial installations have deeply changed the environment of Toscan sea: human wastes, due to the remarkable touristic expansion, more and more pollute the waters and the industrial discharges modify the structure of the bottom and strongly influence the benthic communities. Luckily, this degradation seems to be less conspicuous in the coastal waters of the islands. This is because the geomorphic structure often

makes them scarcely accessible, or access may be legally restricted: for instance Montecristo is integral reserve and Pianosa and Gorgona have penalty-houses and therefore are very difficult to reach.

Material and Methods

The collections made by myself and by a group of divers from Bologna allowed direct observations, chiefly on two different biotopes: the coralligenous rocky bottoms down to about 60 meters and submerged caves. Only in Giglio island's waters I had the opportunity to collect samples with trawls on sandy and muddy bottoms down to 200 meters.

For the continental waters we refer to the work of Auteri & Sordini (1981) on Livorno harbour, and to collections made by us around Argentario.

The specimens cited are kept in my own collection.

Results

Penaeidae

Solenocera membranacea (Risso, 1816)

Argentario 2 ♂♂ — I. Giglio 2 ♀♀, 1 ♂

Parapenaeus longirostris (Lucas, 1846)

Argentario 1 ♀ — I. Giglio 28 ♀♀, 21 ♂♂

Sycionidae

Sicyonia carinata (Brünnich, 1768)

I. Elba 1 ♂

Stenopidae

Stenopus spinosus Risso, 1827

Argentario 2 ♂♂, 2 ♀♀

Pandalidae

Plesionika heterocarpus (Costa, 1871)

I. Giglio 2 ♂♂

Parapandalus narval (Fabricius, 1787)

I. Giannutri 4 ♂♂ in cave.

The species is easy to find in groups of many individuals in some long caves.

Hippolytidae

Hippolyte inermis (Leach, 1815)

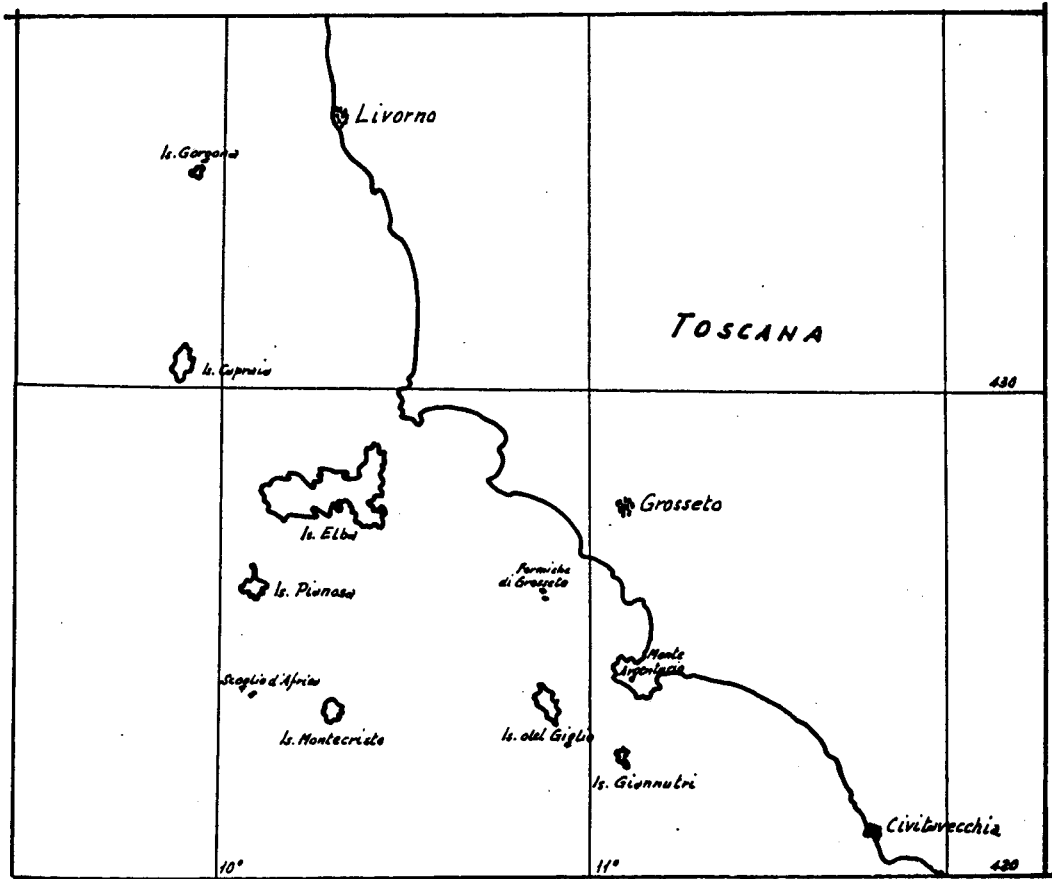


Fig. 1. Map of Arcipelago Toscano.

I. Elba 13 ♂♂, 96 ♀♀.

Hippolyte longirostris (Czerniavsky, 1868)

I. Elba 16 ♀♀ — I. Giglio 1 ♂

Hippolyte holthuisi Zariquiey Alvarez, 1953

I. Giglio 12 ♂♂, 2 ♀♀ — I. Elba 9 ♀♀ — Argentario 5 ♀♀, 1 ♂ on *Lophogorgia*.

Thorulus cranchii (Leach, 1817)

I. Elba 58 ♀♀, 23 ♂♂ — I. Giglio 8 ♂♂, 5 ♀♀.

Thorulus sollaudi (Zariquiey Cennarro, 1935)

I. Giglio 1 ♀ — Argentario 11 ♀♀, 12 ♂♂ on *Lophogorgia*. It seems to live in deeper water than the former species.

Eualus occultus (Lebour, 1936)

I. Capraia 1 ♀ — I. Giglio 6 ♂♂, 1 ♀.

Lysmata seticaudata (Risso, 1816)

I. Giglio 3 ♂♂, 1 ♀ — Formiche di Grosseto 1 ♂.

Lysmata nilita Dohrn & Holthuis, 1950

I. Giglio 1 ♀, 3 ♂♂.

The specimens were caught together with *L. seticaudata* by the small traps described by Turkay (1982). As pointed out in my previous work (Grippa, in press) I think that, despite of the very few records (Frogliia 1981, Moreno & Fernandez-Palacios 1981), it is widely distributed in the Mediterranean almost to the eastern Atlantic ocean and it can be quite common in the little caves of the shaded rocky walls of the coralligenous lower infralittoral, that can assure stable conditions.

Alpheidae

Athanas nitescens (Leach, 1814)

Argentario 1 ♀ — I. Giglio 3 ♀♀, 2 ♂♂

Synalpheus gambarelloides (Nardo, 1847)

I. Giglio 2 ♀♀, 1 ♂

Alpheus macrocheles (Hailstone, 1835)

I. Capraia 2 ♀♀, 1 ♂ — I. Giglio 1 ♂

Alpheus dentipes Guérin, 1832

I. Capraia 4 ♀♀, 1 ♂ — Argentario 1 ♂ — I. Giglio 27 ♀♀, 18 ♂♂ — Formiche di Grosseto 1 ♀, 2 ♂♂

Alpheus glaber (Olivi, 1792)

Argentario 1 ♀, 6 ♂♂ — I. Giglio 4 ♂♂

Processidae

Processa edulis (Risso, 1816)

Argentario 2 ♂♂ — I. Elba 112 ♀♀, 80 ♂♂

Processa macrophthalma Nouvel & Holthuis 1957

I. Giglio 2 ♀♀, 3 ♂♂

Palaemonidae

Palaemon xiphias Risso, 1816

I. Elba 199 ♀♀, 206 ♂♂

Palaemon serratus (Pennant, 1777)

Argentario 3 ♀♀ in cave — I. Giannutri 1 ♂ in cave — I. Giglio 10 ♀♀, 3 ♂♂

Palaemon longirostris H. Milne Edwards, 1837

Argentario 14 ♀♀ — I. Elba 5 ♀♀

Palaemon adspersus Rathke, 1837

Argentario 9 ♀♀, 2 ♂♂ lagoon — I. Giglio 1 ♀

Palaemon elegans Rathke, 1837

Argentario 3 ♀♀ — I. Giglio 6 ♀♀, 1 ♂

Pontonia pinnophylax (Otto, 1821)

I. Giglio 11 ♀♀, 7 ♂♂

Pontonia flavomaculata Heller, 1864

Argentario 1 ♂ in *Ascidia mentula*

Balssia gastii (Balss, 1921)

Argentario 6 ♂♂, 4 ♀♀ — Calafuria 1 ♀

For a long time this species was considered as commensal of *Corallium rubrum* and therefore always more difficult to catch; in 1976 Relini-Orsi reports a casual collection of specimens, violet coloured, associated to *Paramuricea*, and Noël presented slides of *Balssia* mimetically coloured on a yellow *Eunicella*. I had the opportunity to take samples both from Argentario and from Tuscan coasts and both were fished at 40/60 m deep on *Lophogorgia sarmentosa*. All the specimens were orange coloured. The sampling was repeated in different seasons in the same place with identical results, while no specimens was found on *Paramuricea* a few meters far-away. This curious behaviour may suggest that the species can develop, perhaps

through a result of tending, a quite stable adaptative chromatic differentiation to improve survival possibilities. This thesis is supported first by the fact that *Balssia* is a poor swimmer, and moreover that specimens left in an aquarium with other sessile species don't change their colour, as usual for instance in many alpheid shrimps.

Periclimenes scriptus (Risso, 1822)

Argentario 11 ♀♀, 21 ♂♂ — on *Lophogorgia* and alcyonarian — I. Giglio 4 ♂♂

Periclimenes amethysteus (Risso, 1827)

I. Elba 2 ♀♀, 1 ♂ — Calafuria 2 ♀♀ — I. Giglio 2 ♀♀, 1 ♂

Periclimenes sagittifer (Norman, 1861)

I. Giglio 2 ♀♀

Gnathophyllum elegans (Risso, 1816)

Argentario 1 ♂ — I. Giglio 1 ♀, 2 ♂♂.

Crangonidae

Pontocaris lacazei (Gourret, 1887)

I. Giglio 1 ♀

Pontophilus spinosus (Leach, 1815)

Argentario 4 ♀♀, 1 ♂ — I. Giglio 7 ♀♀, 5 ♂♂

Philocheras fasciatus (Risso, 1816)

I. Giglio 1 ♀

Nephropidae

Homarus gammarus (Linnaeus, 1758)

I. Giglio 1 ♂ — I. Giannutri some samples in cave (not collected).

Nephrops norvegicus (Linnaeus, 1758)

I. Giglio 1 ♂, 1 ♀

Palinuridae

Palinurus elephas (Fabricius, 1787)

I. Giannutri 2 ♂♂ — I. Giglio 2 ♂♂, 1 ♀.

Scyllaridae

Scyllarus arctus (Linnaeus, 1758)

I. Giglio 1 ♂, 1 ♀ — Argentario 1 ♂, 2 ♀♀

Scyllarides latus (Latreille, 1803)

I.Giannutri some sample in caves (not collected)

Upogebiidae

Upogebia pusilla (Petagna, 1792)

I.Capraia 1 ♂, 2 ♀♀

Diogenidae

Diogenes pugilator (Roux, 1829)

I.Giglio 9 ♂♂, 9 ♀♀

Paguristes eremita (Linnaeus, 1767)

I.Giglio 6 ♂♂, 8 ♀♀

Clibanarius erythropus (Latreille, 1818)

I.Giglio 31 ♂♂, 45 ♀♀

Calcinus tubularis (Linnaeus, 1767)

I.Giglio 28 ♂♂, 28 ♀♀

Sometimes specimens, chiefly ovigerous females, occupy the empty tubes of polychaete worms.

Paguridae

Pagurus forbesii Bell, 1845

I.Giglio 2 ♀♀, 4 ♂♂

Pagurus cuanensis Bell, 1845

I.Giannutri 1 ♂ — I.Giaglio 4 ♂♂

Pagurus excavatus (Herbst, 1791)

Argentario 2 ♂♂ — I.Giglio 6 ♂♂

Pagurus anachoretus Risso, 1827

Argentario 2 ♂♂ — I.Elba 2 ♂♂, 2 ♀♀, — I.Giglio 15 ♀♀, 13 ♂♂

Pagurus chevreuxi (Bouvier, 1896)

I.Giglio 19 ♂♂, 10 ♀♀ — Argentario 1 ♂

This species seems to be quite common on coralligenous rocky bottom but lives also among the roots of phanerogams in the *Posidonia* prairie. In preference it occupies the *Clanculus* shells.

Pagurus prideaux Leach, 1815.

Argentario 6 ♂♂, 2 ♀♀ — I.Giannutri 1 ♂ — I.Giglio 50 ♂♂, 31 ♀♀

Cestopagurus timidus (Roux, 1830)

I.Elba 4 ♂♂, 1 ♀ — I.Giglio 51 ♀♀, 58 ♂♂

Anapagurus laevis (Bell, 1845)

I.Giglio 6 ♂♂

Anapagurus longispina A.Milne Edwards & Bouvier, 1900

I.Giglio 1 ♂

Anapagurus breviaculeatus Fenizia, 1937

I.Giglio 1 ♀, 6 ♂♂

Anapagurus chiroacanthus (Lilljeborg, 1856)

Argentario 1 ♀ — I.Giglio 1 ♀, 1 ♂

Argepagurus brevicarpus A.Milne Edwards & Bouvier, 1892

I.Giglio 2 ♂♂, 1 ♀

Anapagurus curvidactylus Chevreux & Bouvier, 1892

I.Giglio 1 ♂

Galatheidae*Galathea nexa* Embleton, 1834

I.Capraia 1 ♂

Galathea dispersa Bate, 1859

I.Giglio 1 ♀, 3 ♂♂

Galathea squamifera Leach, 1814

I.Giglio 3 ♂♂

Galathea intermedia Lilljeborg, 1851

Argentario 1 ♀, 2 ♂♂ — I.Capraia 2 ♂♂ — I.Giglio 1 ♀, 2 ♂♂

Galathea bolivari Zariquiey Alvarez, 1950

Calafuria 1 ♂ — I.Ciannutri 2 ♀♀, 3 ♂♂ — I.Giglio 4 ♀♀, 9 ♂♂

Galathea cenarroi Zariquiey Alvarez, 1968

I.Giglio 5 ♂♂

Garcia-Raso (1987) suggests this species to be a synonym of *Galathea bolivari*. I think that this position must be deeper examined and therefore the species is reported separately from the other.

Munida rugosa (Fabricius, 1775)

I.Giannutri 2 ♂♂, 3 ♀♀ — Argentario 1 ♂

Porcellanidae*Porcellana platycheles* (Pennant, 1777)

I. Giglio 2 ♀♀, 6 ♂♂

Pisidia bluteli (Risso, 1816)

I. Giglio 10 ♀♀, 10 ♂♂

Pisidia longicornis (Linnaeus, 1767)

I. Giglio 3 ♂♂

Garcia-Raso (1987) has synonymized this species with *Pisidia longimana* and suggests the hypothesis that also *Pisidia bluteli* can be reduced to a variability form. I can support this thesis considering the fact that many samples caught in the same biotope present intermediate characters so that is often difficult to attribute a sure determination.

Dromiidae*Dromia personata* (Linnaeus, 1758)

Argentario 1 ♂ — I. Capraia 1 ♂ — I. Giannutri 1 ♀, 1 ♂ — I. Giglio 1 pereion.

Homolidae*Homola barbata* (Fabricius, 1793)

I. Capraia 1 ♀

Calappidae*Calappa granulata* (Linnaeus, 1758)

I. Giglio 1 ♀, 1 ♂, 2 pereion.

Dorippidae*Ethusa mascarone* (Herbst, 1785)

Argentario 1 ♂

Medorippe lanata (Linnaeus, 1767)

Argentario 5 ♂♂ — I. Ciglio 12 ♀♀, 3 ♂♂, 2 juv.

Leucosiidae*Ilia nucleus* (Linnaeus, 1758)

I. Giglio 2 pereion.

Portunidae*Carcinus aestuarii* Nardo, 1847

see Auteri & Sordini, 1981

Liocarcinus arcuatus (Leach, 1814)

Argentario 1 ♀ — I.Elba 2 ♀♀

Liocarcinus corrugatus (Pennant, 1777)

I.Elba 6 ♂♂ — I.Giglio 1 ♀, 2 ♂♂

Liocarcinus zariquieyi (Gordon, 1968)

I.Giglio 3 ♂♂

Liocarcinus depurator (Linnaeus, 1758)

Argentario 3 ♂♂, 2 ♀♀

Macropipus tuberculatus (Roux, 1830)

I.Giglio 1 ♀, 7 ♂♂

Geryonidae

Paragalene longicrura (Nardo, 1869)

Argentario 1 ♀

The specimen was collected in the dark part of a deep cave. Previous reports of this species (Türkay, 1976; Gili & Macpherson, 1987) suggest that this species is typical of this kind of habitat.

Xanthidae

Pilumnus spinifer H.Milne Edwards, 1834

I.Giglio 1 ♂

Pilumnus villosissimus (Rafinesque, 1814)

I.Giannutri 1 ♂ — I.Pianosa 1 ♂ — I.Giglio 44 ♀♀, 8 ♂♂

Pilumnus hirtellus (Linnaeus, 1761)

I.Carpaia 3 ♀♀, 1 ♂ — Formiche di Grosseto 1 ♂ — I.Giglio 8 ♀♀, 6 ♂♂, 1 juv.

Eriphia verrucosa (Forsk., 1775)

Argentario 1 ♀ — I.Giglio 3 ♂♂, 1 juv., 2 pereions.

Xantho poressa (Olivi, 1792)

I.Giglio 2 ♀♀, 1 ♂

Xantho pilipes A.Milne Edwards, 1867

I.Giglio 3 ♂♂, 3 ♀♀

Xantho granulicarpus Forest, 1953

I.Capraia 2 ♂♂ — I.Giglio 30 ♀♀, 14 ♂♂.

Paractaea monodi Guinot, 1969

I.Giglio 1 ♂

Pinnotheridae

Pinnotheres pisum (Linnaeus, 1767)

Argentario 1 ♂ — I.Giglio 1 ♀

Pinnotheres pinnotheres (Linnaeus, 1758)

I.Giglio 2 ♀♀

Goneplacidae

Goneplax rhomboides (Linnaeus, 1758)

Argentario 1 ♂ — I.Giglio 4 ♂♂

Grapsidae

Pachygrapsus marmoratus (Fabricius, 1787)

I.Capraia 1 ♀ — I.Giglio 9 ♀♀, 4 ♂♂, 3 juv.

Brachynotus sexdentatus (Risso, 1827)

see Auteri & Sordini, 1981

This species is very common in some coastal localities of Toscana but I have never found it in the insular waters.

Parthenopidae

Parthenope angulifrons Latreille, 1825

Argentario 1 ♂ — I.Giglio ♂♂

Parthenope macrochelos (Herbst, 1790)

I.Capraia 1 ♀, 3 ♂♂

Majidae

Maja squinado (Herbst, 1788)

I.Giglio 1 ♀

Maja crispata Risso, 1827.

Argentario 2 ♂♂ — I.Giglio 7 ♂♂, 1 ♀, 4 pereion.

Many times I have found specimens hidden under *Anemonia sulcata*, together with *Inachus phalangium*; therefore in summer 1987 I decided to verify this assemblage by controlling an individual of actinia for ten days; each day I had the chance to catch a new specimen of this species.

Pisa tetraodon (Pennant, 1777)

I.Giglio 3 ♂♂, 1 juv.

Pisa corallina (Risso, 1816)

I.Elba 1 ♂.

Pisa nodipes (Leach, 1815)

Argentario 1 ♂ — I.Giglio 3 ♀♀, 1 ♂.

Pisa armata (Latreille, 1803)

I.Giglio 1 ♂.

Pisa ps.

I.Capraia — agust 1985 — 60 m about — nets — 1 ♂, carapace L = 4.5 mm, W = 2.5 mm.

Pereion subrectangular, with broad and bifid rostrum on whose proximal half spines are large and flat, with an inner stout acute process; postorbital spine short and preorbital well developed; one hepatic blunt spine with two short apical setae; a stout marginal mesobranchial spine; intestinal margin with a blunt double process. Eyes large with well developed cornea with apical curved setae. Antennae much longer than rostrum with inner silky branch on the base of the first article. Chelipeds with inner margin thickly toothed, outer border of merus with three blunt projections; dactylus of all pereopods toothed; those of Pr5 with 5 internal teeth, the outer margin of merus is very knotty.

This specimen seems to be a juvenile stage of *Pisa* sp. Compared with descriptions by Ingle & Clark (1980) and Bourdillon-Casanova (1960) it shows some differences, chiefly due to the presence of many teeth on the dactylus and to the absence of the epibranchial spin (fig. 2). Due to the courtesy of dr. de Saint-Laurent I had the chance to examine the research of Vadon (1981) who described and figured different juvenile stages of *Pisa muscosa*, *P.nodipes* and *P.tetraodon* caught in *Posidonia* beds. According to this work the specimen can be considered a young stage of *Pisa nodipes*. Quite curious seems to be the depth of capture, due probably to a labelling mistake, or also the specimen could have reached the nets during setting the sail.

Acanthonyx lumulatus (Risso, 1816)

I.Giannutri 1 ♂ — I.Elba 1 ♂, 2 ♀♀ — I.Giglio 4 ♂♂, 2 ♀♀.

Herbstia condyliata (Fabricius, 1787)

Argentario 1 ♂ — I.Giannutri 4 ♂♂, 2 ♀♀ — I.Giglio 1 ♂, 4 pereion.

Eurynome spinosa Hailstone, 1835

I.Giglio 1 ♂

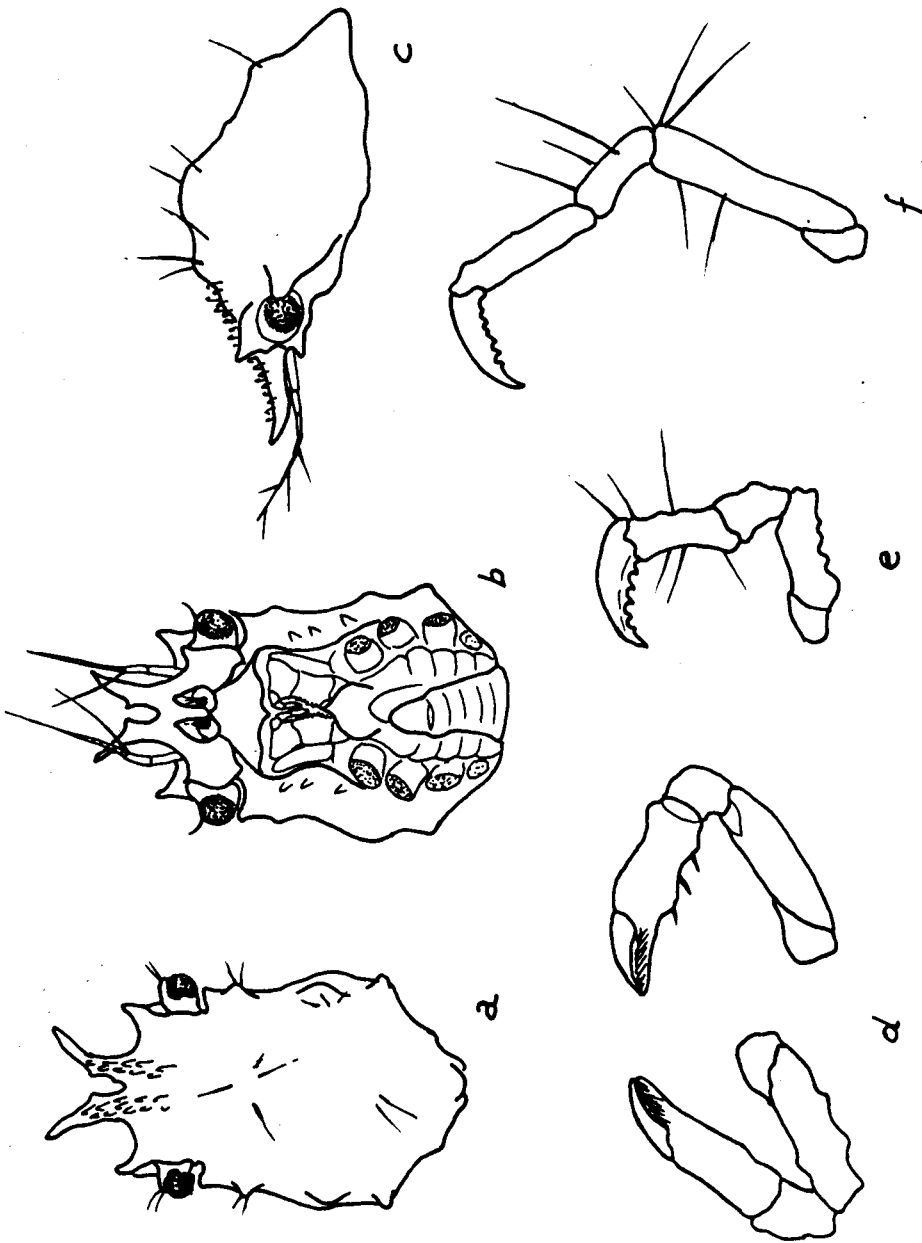


Fig. 2. *Pisa nodipes?* juvenile: a, b, c, pereopod; d, chelipeds; e, 5th pereopod; f, 3rd pereopod.

Lissa chiragra (Fabricius, 1775)

I.Giglio 1 ♂

Inachus communissimus Rizza, 1839

I.Giglio 1 ♂

Inachus dorsettensis (Pennant, 1777)

I.Giglio 5 ♂♂, 2 ♀♀

Inachus phalangium (Fabricius, 1775)

I.Giglio 5 ♀♀, 7 ♂♂

Inachus thoracicus Roux, 1830

Argentario 1 ♂

Achaeus cranchii Leach, 1817

I.Giglio 2 ♂♂, 5 ♀♀

Achaeus gracilis (O.G.Costa, 1839)

I.Giglio 1 ♀

Macropodia czernjawskii (Brandt, 1880)

I.Elba 1 ♂

Macropodia linaresi Forest & Zariquiey Alvarez, 1964.

Argentario 1 ♂, 1 ♀

Macropodia longirostris (Fabricius, 1775)

I.Giglio 1 ♂, 1 ♀

Macropodia longipes (A.Milne Edwards & Bouvier, 1899)

I.Giglio 1 ♀

Garcia-Raso, Gonzales-Gurriaran & Sardà (1987) suggest that *Macropodia longipes* could be only the mediterranean adaptativ form of *M. tenuirostris* (Leach, 1814).

Discussion

The preliminary results of this small collection reveals 118 different species living in Arcipelago Toscano Sea. Only in the I.Giglio waters I had the opportunity to do systematic research, while from the other insular coasts I had only casual samples. This was because the study was devoted chiefly to the investigation of the species living in the particular biotope of the submerged caves or commensal on other sessile animals such as sponges, actinians, alcyonarians, bryozoans and so on, of a well defined area.

To summarize the results of this study it seems useful to split the collected commensal species into two different groups. The first includes the species that are strictly bounded to a specific host, although these may be quite different from each other:

Periclimenes amethysteus on *Anemonia sulcata*
Balssia gastii on *Corallium*, *Paramuricea*, *Eunicella* and *Lophogorgia*.
Pontonia pinnophylax in *Pinna nobilis*
Pontonia flavomaculata in *Ascidia mentula*, *Phallusia mamillata*
Inachus phalangium on *Anemonia sulcata*
Pinnotheres pisum in *Mytilus*, *Pinna*, ascidians
Pinnotheres pinnotheres in *Pinna nobilis*
Macropodia linaresi on alcionarians

The animals of the second group, although with commensal habits, can be considered as occasional hosts, because change easily their host and can be found also in different biotops:

Thoralus sollaudi on alcyonaria and bryozoa
Hippolyte holthuisi on alcyonaria and bryozoa
Eualus occultus chiefly on bryozoa
Periclimenes sagittifer, *P. scriptus* on bryozoa
Synalpheus gambarelloides in sponges and ascidians
Galathea bolivari on bryozoa
Achaeus cranchi on Hydrozoa and Bryozoa

Also the decapods occurring in caves are to be divided in two groups related to different assemblages of dark and semiobscure biotopes as described by Pérès (1982), Riedl (1966) and others. In the aphotic part of the caves were found: *Paragalene longicrura*, *Munida rugosa*, *Parapandalus narval*, *Stenopus spinosus*, *Herbstia condyliata*, *Palaemon serratus*.

The second group of decapods found in the semiobscure part of the same caves includes:

Homarus gammarus, *Scyllarus arctus*, *Galathea strigosa*, *Pagurus prideaux*, *Dromia personata*, *Ethusa mascarone*, *Maja crispata*, *Gnathophyllum elegans*.

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