

Uropodal rami robust, reaching just beyond posterior margin of pleotelson. External margin of exopod with 6-7 more or less prominent teeth, mostly situated in the caudal part. However, females sometimes having irregularly serrated margin.

Ecology. — *L. levii* is an intertidal species, often found in sheltered places, under stones or in rock crevices and shells. Although they seem to need a less clean substratum than *S. serratum*, the two species are sometimes found in mixed populations.

Distribution. — The species is characterised by an extensive range along the Atlantic coasts. It has been found in the British Isles, France, Spain and Portugal. Recently a specimen was found in a sample of *S. serratum* collected near Ischia (Italy); this might be due to human activity, e.g. shipping (it was found in Naples dock), which has also affected the distribution of *S. walkeri*.

### **Lekanesphaera rugicauda** (Leach, 1814)

(fig. 16)

Restricted synonymy:

? *Oniscus conglobator* Pallas, 1766: 194.

? *Oniscus globator* Pallas, 1772: 70-71.

? *Asellus globator*, Olivier, 1789: 256.

*Sphaeroma cinerea* Bosc, 1802: 186; Latreille, 1802: 16-17; Latreille, 1806: 65.

*Sphaeroma rugicauda* Leach, 1814: 405, 433; Desmarest, 1825: 300-301; Bouchard-Chanteraux, 1833: 19-20; Milne Edwards, 1840: 207; White, 1857: 245; Bate & Westwood, 1886: 408-409; Parfitt, 1874: 255-256; Meinert, 1890: 190; Leichman, 1891: 1-11; Stebbing, 1893: 361; Dollfus, 1899: 123-124; Hansen, 1905: 73, 76, 116; Gurney, 1907: 417, 427-428, 433; Apstein, 1908: 43; Bjørck, 1915: 37; Dahl, 1916: 28, 72; Nierstrasz, 1917: 107; Nierstrasz, 1922: 318-320; Giltay, 1927: 58; Nierstrasz & Schuurmans-Stekhoven, 1930: 80; Wahrberg, 1930: 28-29; Monod, 1931b: 42-44; Omer-Cooper & Rawson, 1934: 22-26, 34-38; Stephensen, 1948: 46-47; Urbánski, 1950: 337; Forsman, 1952: 154-157; Margalef, 1953: 174; Holthuis, 1956: 59-63; Messner & Wohlrab, 1959: 172-176; Gruner, 1965: 57-61; Lejuez, 1966: 502-507, 526-546, 607-623; Harvey, 1969: 399-406; Naylor, 1972: 34; Zmudzinski, 1974: 130-131; Laulier & Lejuez, 1976: 1779-1781; Kussakin, 1979: 380-382; Laulier, 1979: 417-429.

*Sphaeroma globator*, Guérin-Méneville, 1844: 27-30.

*Sphaeroma marginata* Milne Edwards, 1840; Leuckart, 1847: 158.

*Sphaeroma balticum* Schiødt, 1866: 177-178.

*Sphaeroma rugicandata* Bate, 1878: 122, incorrect spelling.

*Sphaeroma longicauda* Stebbing, 1911: 157, incorrect spelling.

*Exosphaeroma rugicauda*, Tattersall, 1916: 37; Tattersall, 1930: 105; Giltay, 1927: 57.

*Sphaeroma rugicaudum*, Seifert, 1938: 240; Seifert, 1939: 15; Harrison & Holdich, 1984: 378.

*Europosphaera rugicauda*, Verhoeff, 1943a: 171-172.

Material examined. — RMNH: Spain: Guadalquivir, N. of Bonanza, prov. Cadiz (salt marshes, on an old car-tire, Exc. RMNH, May 1971, many specimens); Ria de Arosa, Rio Umia, prov. Pontevedra, near the bridge of Santo Tomé do Mar (Exc. RMNH, August 1964, many specimens); Ria de Arosa, Rio Umia, prov. Pontevedra, near the bridge of Cambados, SW. of

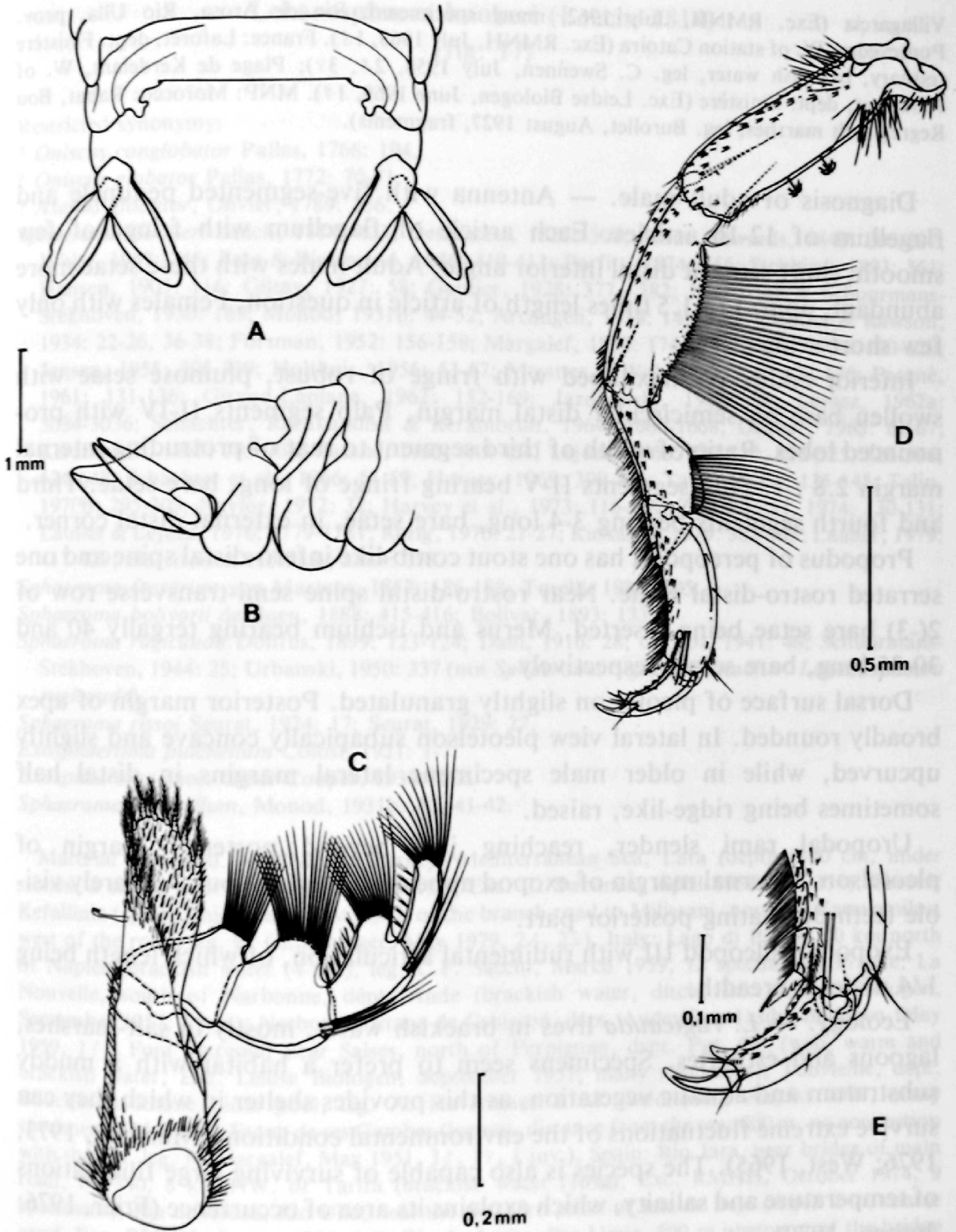


Fig. 16. *L. rugicauda* (Leach). a-e, after Lejuez (1966): a, pleotelson in tergal view; b, pleotelson in lateral view; c, Mxp; d, Pl; e, detail Pl.

Villagarcia (Exc. RMNH, July 1962, many specimens); Ria de Arosa, Río Ulla, prov. Pontevedra, W. of station Catoira (Exc. RMNH, July 1963, 1♂). France: Laforêt, dépt. Finistère (estuary, brackish water, leg. C. Swennen, July 1958, 2♂, 3♀); Plage de Kerdelant, W. of Plouescat, dépt. Finistère (Exc. Leidse Biologen, June 1969, 1♀). MNP: Morocco: Rabat, Bou Regreg (salt marshes, leg. Burolet, August 1927, fragments).

Diagnosis of adult male. — Antenna with five-segmented peduncle and flagellum of 12-16 articles. Each article of flagellum with fringe of few smooth, short setae at distal interior angle. Adult males with these setae more abundant, up to 1 to 1.5 times length of article in question. Females with only few short setae.

Interior endite of maxilliped with fringe of robust, plumose setae with swollen base on semicircular distal margin. Palp segments II-IV with pronounced lobes. Ratio of width of third segment to that of protruding internal margin 2.8 : 1. Palp segments II-V bearing fringe of long, bare setae. Third and fourth segments bearing 3-4 long, bare setae, in external distal corner.

Propodus of pereopod I has one stout comb-like infero-distal spine and one serrated rostro-distal spine. Near rostro-distal spine semi-transverse row of 2(-3) bare setae being inserted. Merus and ischium bearing tergally 40 and 30-35 long, bare setae, respectively.

Dorsal surface of pleotelson slightly granulated. Posterior margin of apex broadly rounded. In lateral view pleotelson subapically concave and slightly upcurved, while in older male specimens lateral margins in distal half sometimes being ridge-like, raised.

Uropodal rami slender, reaching just beyond posterior margin of pleotelson. External margin of exopod appearing smooth, but 2-3 barely visible teeth decorating posterior part.

Exopod of pleopod III with rudimental articulation, of which length being 1/4 of total breadth.

Ecology. — *L. rugicauda* lives in brackish water, mostly in salt-marshes, lagoons and estuaries. Specimens seem to prefer a habitat with a muddy substratum and aquatic vegetation, as this provides shelter in which they can survive extreme fluctuations of the environmental conditions (Marsden, 1973, 1976; West, 1965). The species is also capable of surviving large fluctuations of temperature and salinity, which explains its area of occurrence (Frier, 1976; Jansen, 1970).

Distribution. — The species has an extensive range along the East Atlantic coast. It has been found in the Baltic, Denmark, Sweden, Poland, the British Isles, the Netherlands, Belgium, France, Portugal and Morocco.

**Lekanesphaera hookeri** (Leach, 1814)

(fig. 17)

## Restricted synonymy:

? *Oniscus conglobator* Pallas, 1766: 194.? *Oniscus globator* Pallas, 1772: 70-71.? *Asellus globator*, Olivier, 1789: 256.

*Sphaeroma hookeri* Leach, 1814: 433; Desmarest, 1825: 300; Milne Edwards, 1840: 206-207; White, 1957: 245; Bate & Westwood, 1886: 410-411; Parfitt, 1874: 256; Stebbing, 1893: 361; Hansen, 1905: 116; Giltay, 1927: 58; Gautier, 1928: 377-382; Nierstrasz & Schuurmans-Stekhoven, 1930: 169; Monod, 1931b: 44-52; Arcangeli, 1934: 14; Omer-Cooper & Rawson, 1934: 22-26, 36-38; Forsman, 1952: 156-158; Margalef, 1953: 174-175; Kinne, 1954: 100-120; Jensen, 1955: 305-339; Holthuis, 1956: 63-67; Messner & Wohlrab, 1959: 172-176; Patanè, 1961: 131-136; Giraud-Laplane, 1962: 152-169; Jazdzewski, 1962: 91; Lejuez, 1962a: 3034-3036; Schachter, Razakandisa & Kerambrun, 1964: 1666-1668; Gruner, 1965: 61-67; Kerambrun, 1965: 705-708; Patanè, 1965: 449-464; Lejuez, 1966: 507-512, 515-525, 526-546, 624-648; Schachter et al., 1966: 51-59; Harvey, 1969: 399-406; Talin, 1970a: 135-145; Talin, 1970b: 295-303; Naylor, 1972: 32; Harvey et al., 1973: 116-119; Zmudzinski, 1974: 130-131; Laulier & Lejuez, 1976: 1779-1781; Rezig, 1976: 21-27; Kussakin, 1979: 382-385; Laulier, 1979: 417-429; Harrison & Holdich, 1984: 378.

*Sphaeroma fossarum* von Martens, 1857: 186-188; Torelli, 1930: 305.

*Sphaeroma bolivarii* de Buen, 1888: 415-416; Bolivar, 1893: 133.

*Sphaeroma rugicauda* Dollfus, 1899: 123-124; Dahl, 1916: 28; de Vos, 1941: 46; Schuurmans-Stekhoven, 1944: 25; Urbanski, 1950: 337 (not *Sphaeroma rugicauda* Leach = *Lekanosphaera rugicauda*).

*Sphaeroma rissoi* Seurat, 1924: 17; Seurat, 1929: 27.

*Exosphaeroma pulchellum* Colosi, 1921: 1-7.

*Exosphaeroma* spec. Omer-Cooper, 1930: 252.

*Sphaeroma pulchellum*, Monod, 1931b: 22, 41-42.

Material examined. — RMNH: Turkey: Mediterranean Sea, Lara (depth 0-50 cm, under stones; a strong flow of fresh water, Turkey Exc. C. Swennen, April 1959, 1♂, 1♀). Greece: Kefallinia (spring (micro-lake) just north of the branch road to Milissani, north of Karavomilos, west of the road, leg. E. Gittenberger, May 1979, 2♂, 2♀). Italy: Lago di Patria, 40 km north of Naples (brackish water (4-5‰), leg. C.F. Sacchi, March 1959, 12 specimens). France: La Nouvelle, south of Narbonne, dépt. Aude (brackish water, ditch, Exc. Leidse Biologen, September 1957, 1 juv.); Narbonne, Etang de Gruisson, dépt. Aude (Exc. Leidse Biologen, May 1959, 1♂); Font Estramar near Salses, north of Perpignan, dépt. Pyr. Or. (well, warm and brackish water, Exc. Leidse Biologen, September 1957, many specimens); Touvieille, dépt. Bouches-du-Rhône (little pool, leg. A. Havermans & M. Veldhoven, August 1977, many specimens). Mallorca, Etang de ses Gambes (lagoon, distance from the sea: 800 m, no connection with the sea, leg. R. Margalef, May 1951, 3♂, 1♀, 1 juv.). Spain: Rio Jara, near bridge of main road, N. 340, 8 km NW. of Tarifa (brackish water (16‰), Exc. RMNH, October 1974, 9 specimens); Ria de Arosa, Rio Ulla, near the northern point of Isla de Bejo (depth 2 m, coarse sand, Exc. RMNH, August 1964, 1♂); Ria de Arosa, Rio Umia, 500 m upstream of the bridge near Santo Tomé de Mar (together with *L. levii* and within a distance of 400 m of a population of *L. rugicauda*, Exc. RMNH, August 1964, 1 juv.); Ria de Arosa, Rio Umia, bridge near Cam-bados, SW. of Villagarcia, Exc. RMNH, July 1963, 4♂, 2♀, 1 juv.). Morocco: Oued Cherrat, little river 32 km south of Rabat, near the main road Rabat-Casablanca (near a bridge, brackish water (3‰), Exc. RMNH, October 1974, 1 juv.); Buel es Seghiz, 45 Km E. of Tangier, main road 704 (salinity 35‰, Exc. RMNH, October 1974, many specimens); between Tangier and Ceuta, 22 km E. of Tangier (shallow "wadi"; salinity 25‰, Exc. RMNH, October 1974, many



specimens). The Netherlands: Den Helder, Fortgracht (leg. C. Swennen, February 1950, 3♂, 3♀). PCJ: France: Camargue: Etang de Gr. Palun, dépt. Bouches-du-Rhône (warm, brackish water, depth 1-3 cm, muddy substratum, leg. B.J.M. Jacobs, July 1982, many specimens); Camargue: Etang de Repausset, in the direction of La Grande Motte, dépt. Bouches-du-Rhône (brackish water, depth 10 cm, under stones, leg. B.J.M. Jacobs, July 1982, many specimens).

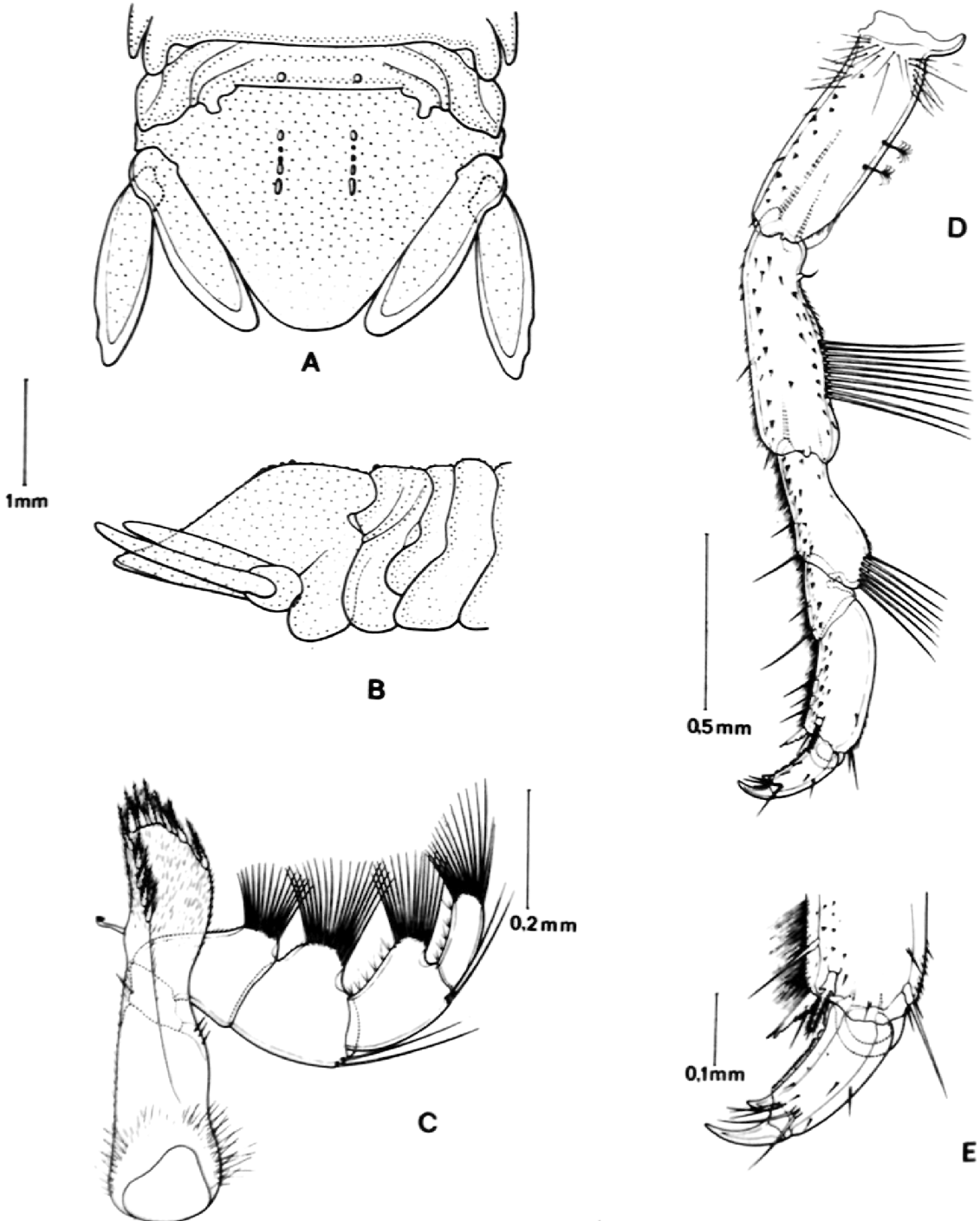


Fig. 17. *L. hookeri* (Leach). a-e, after Lejuez (1966): a, pleotelson in tergal view; b, pleotelson in lateral view; c, Mxp; d, Pl; e, detail Pl.

Diagnosis of adult male. — Antenna with five-segmented peduncle and flagellum of 12-16 articles. Each article of flagellum with fringe of few smooth, short setae at distal interior angle. Adult males with these setae more abundant, up to one to two times length of article in question. Females with only few short setae.

Interior endite of maxilliped with fringe of robust, plumose setae with swollen base on semicircular distal margin. Palp segments II-IV with pronounced lobes. Ratio of width of third segment to that of protruding internal margin 2.8 : 1. Palp segments II-V bearing fringe of long, bare setae. Third and fourth segments bearing 1-2 long, bare setae, in external distal corner.

Propodus of pereopod I with one stout comb-like infero-distal spine and one serrated rostro-distal spine. Near rostro-distal spine no setae being inserted. Merus bearing tergally 2-10 or 15-20 long, bare setae. Ischium bearing 3-10 or 15-20 long, bare setae.

Dorsal surface of pleotelson with two ridges of tubercles, one on either side on midline. Dorsal surface of fused abdomen sometimes bearing two, more or less pronounced, tubercles, as also can be seen on seventh segment of pereon. Posterior margin of apex rounded. In lateral view pleotelson subapically concave and slightly upcurved.

Uropodal rami slender, reaching just beyond posterior margin of pleotelson. External margin of exopod appearing smooth, but in older specimens with 2-3 barely visible teeth decorating posterior part.

Exopod of pleopod III with rudimental articulation, of which length being 1/5 to 1/3 of total breadth.

Ecology. — *L. hookeri* lives in brackish water, and is mostly found in estuaries, brackish inland ditches and salt marshes. Specimens prefer stagnant water and a muddy substratum, and are found under stones or in shallow water amongst sea-weed. The species is better able to survive low salinities (3‰), than strong fluctuations in salinity; this in contrast to *L. rugicauda*.

Distribution. — The species has an extensive range which in Europe even exceeds that of *S. serratum*. Along the Baltic and Atlantic coasts it is found from Poland to Morocco. Furthermore it is found throughout the Mediterranean, as far east as Lara (10 km SE. of Antalya, Turkey), and also in the Adriatic and the Aegean Seas.

Remarks. — The names *Oniscus conglobator* Pallas, 1766 and *O. globator* Pallas, 1772, the oldest available names for any sphaeromatid species, are usually considered nomina dubia and have been ignored during the last 200 years. It is not possible to determine with certainty on which species these names are based (it could be *L. rugicauda* as well as *L. hookeri*). Pallas' original description is inadequate for identification and there are no type

specimens known. A request will be submitted to the International Commission on Zoological Nomenclature to use its plenary powers to suppress both names.

As many research workers noticed, *L. hookeri* is a species that shows noticeable and recognisable differences between the diverse populations. These differences are described, but none of these populations is given the status of subspecies. Lejuez (1962a, 1966) studied several specimens collected in the Mediterranean and along the Atlantic coasts. He found a few constant differences between populations from NW. Europe and the Mediterranean, and he gave both groups of populations the status of subspecies: *L. hookeri hookeri* and *L. hookeri mediterranea*, respectively.

I do agree with the taxonomic views of Lejuez (1962a) but the name of the Mediterranean subspecies should be *L. hookeri sardoa* (Arcangeli, 1934). Arcangeli had already noticed the differences between populations of *L. hookeri* and characterised one population from the Mediterranean (Sardinia, Italy) as a new subspecies. As the type specimens of *L. hookeri sardoa* (Arcangeli, 1934) and *L. hookeri mediterranea* (Lejuez, 1962a) belong to the same subspecies the oldest name, viz. the one proposed by Arcangeli, has priority.

I studied samples of diverse populations in order to find the limits of both subspecies or perhaps the presence of a transitional area. *L. hookeri sardoa* is not limited to the Mediterranean, but it is also found in Morocco and S. Portugal. *L. hookeri hookeri*, which Lejuez (1962a, 1966) described from the NW. European coasts, has its most southern limit in NW. Spain: Ria de Arosa.

A short diagnosis of both subspecies is given below.

### ***Lekanesphaera hookeri hookeri* (Leach, 1814)**

Diagnosis. — Antenna: setae at distal interior angle of each article of flagellum longer than article.

Maxilliped: palp segments II-IV with pronounced lobes bearing fringes of long, bare setae. Setae inserted in external distal corner of third and fourth segments reaching as far as end of next segment.

Pereopod I: lobe of merus little developed, bearing 15-20 long, bare setae. Ischium bearing 15-20 setae.

Pleotelson: two ridges of tubercles little developed. In lateral view pleotelson proximally convex, while transition to concave part being rather gradual.

Distribution. — NW. Europe.

**Lekanesphaera hookeri sardoa** (Arcangeli, 1934)

*Sphaeroma hookeri mediterranea* Lejuez, 1962: 3034-3036.

Diagnosis indicating distinction from *L. hookeri hookeri*. — Antenna: setae at distal interior angle of each article of flagellum reaching only as far as end of article, and being less abundant.

Maxilliped: palp segments II-IV with strongly pronounced lobes and fringe of shorter, less numerous, bare setae. Setae inserted in external distal corner of third and fourth segments reaching up to 2/3 of length of segment.

Pereopod I: lobe of merus well developed, bearing 2-10 long, bare setae. Ischium bearing 3-10 setae.

Pleotelson: two ridges of tubercles strongly developed. In lateral view pleotelson proximally convex, while transition to concave part being rather abrupt.

Distribution. — Mediterranean, Morocco, S. Portugal.

**Lekanesphaera glabella** spec. nov.

(figs. 18, 19)

Material examined. — Holotype: (RMNH: 6622) adult male, 8 mm, Funchal, south coast of Madeira, W. of harbour pier, 32°38'N, 16°55'W; polluted rocky littoral pool, coll. Tydeman Madeira-Mauritania Exp. 1978 sta 3KO3 (Cancap III), 10 or 17 October 1978. Paratypes: (RMNH: 6623) numerous specimens, Funchal, south coast of Madeira, W. of harbour pier, 32°38'N, 16°55'W; polluted rocky littoral pool, coll. Tydeman Madeira-Mauritania Exp. 1978 sta 3KO3 (Cancap III), 10, 17 October 1978. (RMNH: 6624) numerous specimens, Funchal, south coast of Madeira, west of harbour pier, 32°38'N, 17°05'W; rocky littoral/sublittoral with boulders, coll. Onversaagd Madeira-Morocco Exp. 1976 sta 8 (Cancap I), 24 February 1976. (RMNH: 7013) numerous specimens, Funchal, south coast of Madeira, 32°41'N, 16°57'W; polluted littoral, rocky sandy flat with silt, coll. Tydeman Selvagens-Canary Isl. Exp. sta 4K16 (Cancap IV), 24 May 1980. BMNH: numerous specimens, Madeira, coll. A.M. Norman, 1897.

Description. — Adult male: *Lekanesphaera* of medium length (8-9 mm) with body slender, sub-elliptical, 1.6 times as long as broad. Cephalon and pereonites smooth, lacking tubercles or granulation. Pleotelson smooth, 1.5 times as broad as long, in lateral view convex in proximal part and little concave subapically, the caudal part hardly curved up. Posterior margin of pleotelson smooth, narrow and rounded.

Appendages: A1 with peduncle segment 1 globular, twice as long as broad, with many fine setae on internal side. Peduncular segment 2 of A1 short, with four short, plumose setae on external margin and one bare seta at distal internal angle. Segment 3 slender, cylindrical, with few plumose distal setae.



Flagellum little shorter than peduncle. First two articles bare, others carrying at distal internal angle two aesthetascs. Last two articles however with one aesthetasc in proximal internal angle, flagellum ending with five setae. A2 with peduncle segments 1 and 2 small and short, segment 3 longer; segments 2 and 3 with one and three setae respectively in distal internal angle. Segments

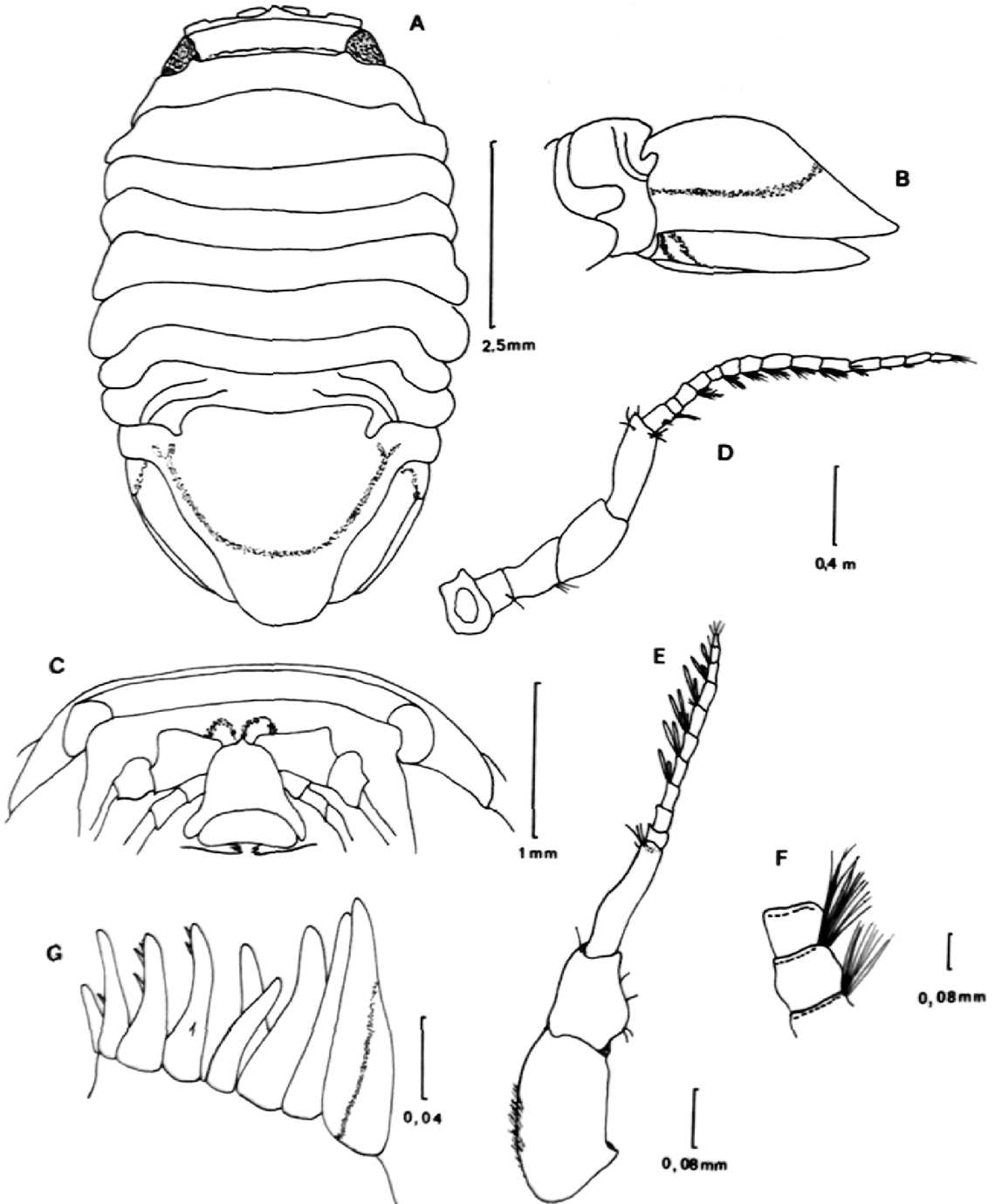


Fig. 18. *L. glabella* spec. nov. a-g, RMNH coll. nr. 6622: a, tergal view; b, pleotelson in lateral view; c, cephalon in rostral view; d, A2; e, A1; f, detail A2; g, detail outer lob Mxl.

4 and 5 as 3, longer than broad, segment 5 with stiff setae at distal margin. Flagellum 15-articled, little longer than peduncle. Each article in proximal part of flagellum short; longer and more slender in distal part. Each article, especially proximal ones, bearing fringe of few, smooth setae at distal internal angle. These setae reaching 2 to 2.5 times length of article. Mnds with incisor processes dentate, lacinia mobilis of left mnd well developed, segment 1 of

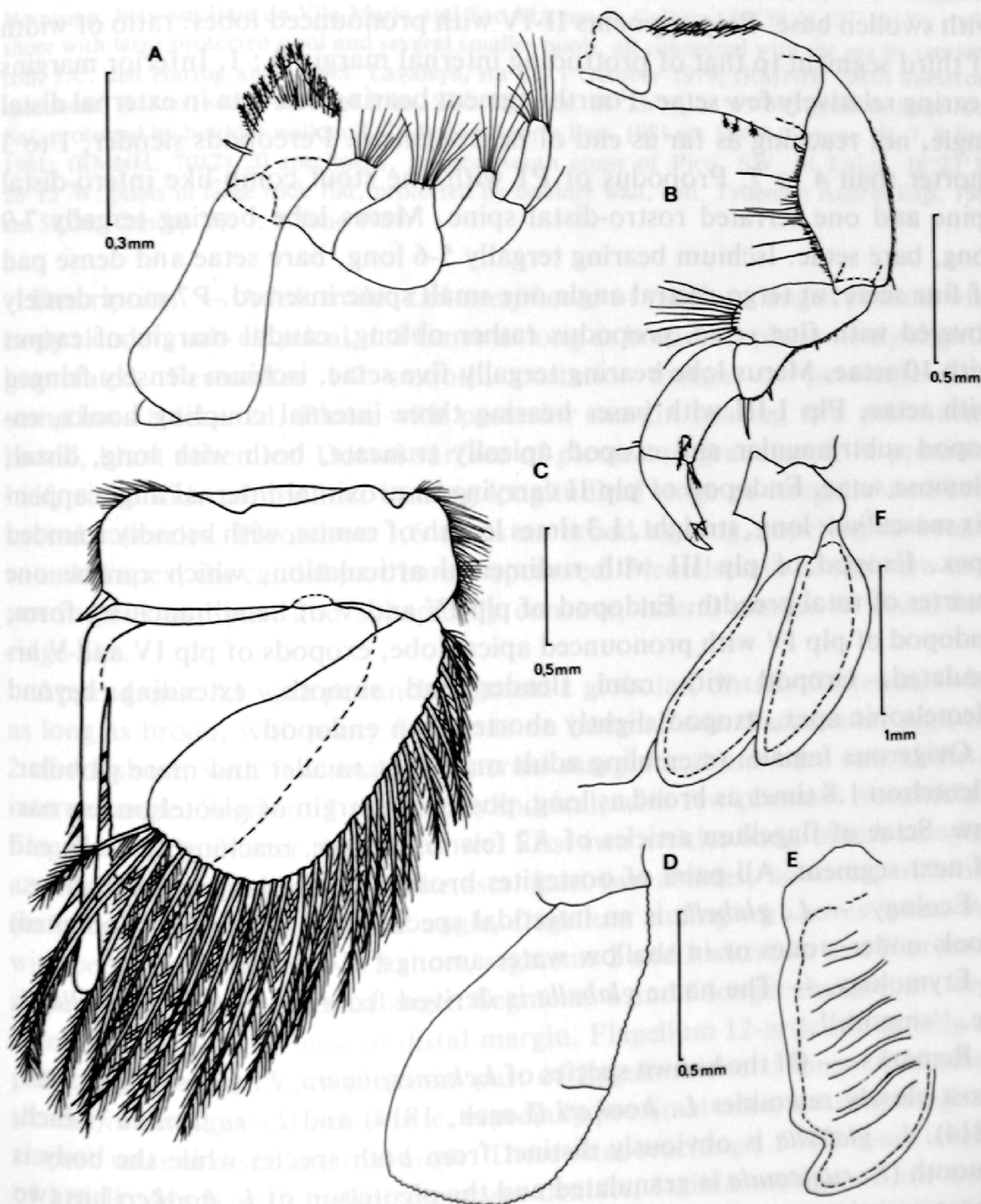


Fig. 19. *L. glabella* spec. nov. a-f, RMNH coll. nr. 6622: a, Mxp; b, Pl; c, Plp II; d, exopod of Plp III; e, endopod of Plp IV; f, uropod.

mandibular palp long, bearing fringe of fine setae, segments 2 and 3 with fringe of strongly plumose setae on external side, length of setae increasing distally. Mx1 with inner lobe having four long setae with swollen base, outer lobe with ten, often serrated, distal spines. Mx2 with outer lobes bearing long, ribbed and curved setae with swollen base, inner lobe bearing 12 setae with swollen base, distally plumose. Mxp with sympodite broad and globular, having fine setae. Endite ending distally in semi-circular fringe of strongly plumose setae with swollen base. Palp segments II-IV with pronounced lobes: ratio of width of third segment to that of protruding internal margin 3 : 1. Inferior margins bearing relatively few setae. Fourth segment bearing one seta in external distal angle, not reaching as far as end of next segment. Pereopods slender, 1 to 3 shorter than 4 to 7. Propodus of P1 with one stout comb-like infero-distal spine and one serrated rostro-distal spine. Merus lobe bearing tergally 7-9 long, bare setae. Ischium bearing tergally 5-6 long, bare setae and dense pad of fine setae; at tergo-rostral angle one small spine inserted. P7 more densely covered with fine setae, propodus rather oblong, caudal margin of carpus with 10 setae. Merus lobe bearing tergally five setae, ischium densely fringed with setae. Plp I-III with bases bearing three internal coupling hooks, endopod subtriangular and exopod apically truncate, both with long, distal, plumose setae. Endopod of plp II carrying in proximal-internal angle appendix masculina: long, straight, 1.3 times length of ramus, with broadly rounded apex. Exopod of plp III with rudimental articulation, which can be one quarter of total breadth. Endopod of plp IV and V of hemibranchiate form, endopod of plp IV with pronounced apical lobe, exopods of plp IV and V articulated. Uropod with rami slender and smooth, extending beyond pleotelsonic apex, exopod slightly shorter than endopod.

Ovigerous female: resembling adult male, but smaller and more globular. Pleotelson 1.8 times as broad as long, posterior margin of pleotelson less narrow. Setae of flagellum articles of A2 few in number, reaching as far as end of next segment. All pairs of oostegites broad and overlapping in midline.

Ecology. — *L. glabella* is an intertidal species, found in rocky, (polluted) pools under stones or in shallow water amongst *Enteromorpha*.

Etymology. — The name *glabella* is derived from the Latin "*Glabellus*", i.e. "smooth".

Remarks. — Of the known species of *Lekanesphaera*, *L. glabella* spec. nov. most closely resembles *L. hookeri* (Leach, 1814) and *L. rugicauda* (Leach, 1814). *L. glabella* is obviously distinct from both species while the body is smooth (*L. rugicauda* is granulated and the pleotelson of *L. hookeri* has two characteristic rows of tubercles). Also it is a marine species, while both other species are found in brackish water.