LEANDER LONGIROSTRIS (H. M.-EDW.) VAR. ROBUSTA NOV. VAR., THE COMMON PRAWN OF THE ESTUARY OF THE MEUSE AND OF THE HOLLANDSCH DIEP

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(With two text-figures).

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With the compliments of

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Leander longirostris was described in 1837 by H. MILNE-EDWARDS on page 392 [1]) of the second volume of the „Histoire naturelle des Crustacés" under the name of *Palaemon longirostris*; the very brief description, hardly a diagnosis, reads as follows: „Cette espèce ressemble extrêmement au P. squille, mais s'en distingue facilement par ses pates beaucoup plus grêles et plus longues; celles de la dernière paire, lorsqu'elles sont reployées en avant, dépassent de beaucoup l'extrémité de l'appendice lamelleux des antennes externes. La forme de la main est également différente. Longueur, environ 2 pouces.

Trouvé à l'embouchure de la Garonne, près de Bordeaux. (C. M.)." The indian *Leander styliferus* (H. M.-Edw.), mentioned in the footnote, occurs repeatedly in the literature of the last century under the name of *L. longirostris* (H. M.-Edw.), evidently in consequence of the Errata, published in 1840 in the third volume p. 638, having been wanting in many copies of the „Histoire naturelle", as is the case with my own one. These Errata were also apparently missing in the copy employed by C. HELLER, when in 1863 his valuable work „Die Crustaceen des südlichen Europa" was published. On page 265 of this work the author indeed remarks at the beginning of the

1) In consequence of a clerical error on page 394 a quite different species from „l'embouchure du Gange" was described by MILNE-EDWARDS likewise under the name of *Palaemon longirostris*, but three years afterward this error was remedied by the author when in Errata Vol. III, p. 638, 1840, he suggested for this species the name of *P. styliferus*, which name, as miss RATHBUN remarks, in: „Proc. United States Nat. Museum, Vol. XXVI, 1902, p. 51, „was apparently overlooked by subsequent authors, but which must stand for that species." With this *Leander styliferus* (H. M.-Edw.) we have here of course nothing to do.

description of *Palaemon Edwardsii*: „Da eine schon früher von SAY beschriebene Art als *P. longirostris* bezeichnet ist, so habe ich die obige von M.-EDWARDS aufgestellte neu benannt"; he describes then the species of the river Garonne under the name of *P. Edwardsii* after specimens from the Mediterranean. *Leander Edwardsii* (Heller) is consequently *identical* with *L. longirostris* (H. M.-Edw.).

In my Revision of the european species of the genus *Leander* (On some European Species of the Genus *Leander* Desm., also a contribution to the Fauna of Dutch waters), published eight years ago in Vol. XIV of this Journal, on page 149—165 a detailed description is given of a species that abundantly occurs in the estuary of the Meuse and in the Hollandsch Diep, under the name of *Leander longirostris* (H. M.-Edw.), while the figures 3—3 m on Plate XII refer to it. When, having taken upon myself in November 1922 to work out a collection of Palaemonidae from the Belgian Kongo, I was studying the literature on the Decapoda of West Africa, my attention was particularly drawn to two figures of a species from Old Calabar, South-Nigeria, referred by Dr. BALSS to *Leander Edwardsii* (Heller), because they did disagree very much with the figures of *L. longirostris* in my paper (H. BALSS, Beiträge zur Kenntnis der Meeresfauna Westafrikas. Crustacea II. Decapoda Macrura und Anomura (ausser Fam. Paguridae). Hamburg 1916, p. 26, Fig. 7 u. 8.). I therefore determined to make again a search in this question and to try in the first place to obtain specimens of *L. longirostris* (H. M.-Edw.) from the mouth of the river Garonne or from the Mediterranean in order to compare them accurately with the species that is found in the Hollandsch Diep. At my great disappointment my attempts to obtain specimens from the mouth of the Garonne have been made in vain.

I then applied to the Société des Sciences, Lettres, Arts et d'Études Régionales de Bayonne and took the liberty to write to the President, M. le Commandant DE HOYM DE MARIEN at Bayonne, with the kind request to send me prawns of the genus *Leander* from the mouth of the river Adour and from the neighbouring coast. Both Mr. DE MARIEN and Mr. S. F. GIMENEZ, engineer at Ciboure (Basses Pyrénées), the author of a List [1]) of the Cetacea, Fishes and Crustacea commonly found on that coast, the names of which are mentioned in five languages, have shown much interest for this question and a great benevolence towards me. Both gentlemen indeed took the trouble to go out fishing for me in person, Mr. DE MARIEN at Cap Breton near the mouth of a small river, Mr. GIMENEZ in the port of St. Jean de Luz and in the river Nivelle; the captured specimens, together with a lot of prawns belonging to the genus *Leander* from the mouth of the river Adour, came into my

1) S. F. GIMENEZ. Catalogue révisé des Cétacés, Poissons et Crustacés les plus communs de la côte Labourdine du Golfe de Gascogne. Noms en Français, Latin, Basque, Anglais, Espagnol. Bayonne 1922.

possession at one of the first days of May. Unfortunately typical specimens of *L. longirostris* were wanting entirely also in this collection! The 27 specimens, fished in the mouth of the Adour and in brackish water of the Nivelle two kilometers above St. Jean de Luz, did all belong to the species of the Hollandsch Diep; this species was, however, already known to occur in the Gulf of Gascony, for on page 163 of my work of 1915 a specimen is described that was collected at Biarritz. These 27 quite undamaged specimens, 8 of which are egg-bearing, are, however, of some interest for me, because they enable to verify the specific characters also in specimens from the Gulf of Gascony and because the specimen from Biarritz, described in 1915, was but a young female. The numerous specimens collected at Cap Breton, to the number of 56, of which 19 are egg-bearing, like also 13 from the port of St. Jean de Luz, all belong without any exception to *Leander squilla* (Linné) var. *intermedia* de Man: my supposition (J. G. DE MAN, l. c. p. 133) that this variety should once prove to occur along the whole west coast of France, is thus affirmed. It appears to me probable that these prawns are found in shoals of specimens which all belong to the same species and that the absence of the typical *L. longirostris* must be ascribed to a shoal of this species having accidentally not been taken.

Though I thus did not succeed in obtaining specimens of the typical *L. longirostris* from the mouth of the river Garonne or from the Gulf of Gascony, I am nevertheless come into the possession of seven specimens of the typical species through the kindness of Dr. O. PESTA at Vienna and of Prof. GRAVIER at Paris. The former namely has been so kind to present me with six complete specimens under the name of *Leander Edwardsii* (Heller), collected in 1864 by Dr. STEINDACHNER in the river Guadalquivir near Sevilla: six almost adult females without eggs of somewhat unequal size. The seventh specimen, also a female without eggs, has the same size as the largest one of the six already mentioned, was likewise collected at Sevilla and was presented in 1899 by the Naturhistorisches Museum at Vienna to that of Paris, so that this specimen has no doubt pertained to the collection gathered by STEINDACHNER. Furthermore Dr. BALSS of Munich had the courtesy to send me upon my request two of the three females from Old Calabar of the species which (H. BALSS, l. c. p. 26) is described and figured by him under the name of *Leander Edwardsii* Heller. Finally Professor K. M. HELLER of the Museum für Tierkunde at Dresden presented me with a cotype of *Leander maculatus* Thallwitz from West Africa and sent me some information about this species, that was described by Dr. THALLWITZ on page 19 of his work „Decapoden-Studien", published in 1891 at Berlin.

My best thanks are therefore due to all these gentlemen for their benevolent help and assistance.

The accurate examination of these specimens and a comparison with the numerous specimens from the Hollandsch Diep, that are

preserved in my private collection, have now yielded the following results:

1) The species described by BALSS under the name of *Leander Edwardsii* HELLER, from West Africa, does not belong to this species, but to *Leander maculatus* THALLWITZ.
2) The species, described by me (l. c. 1915) under the name of *L. longirostris*, *disagrees* with the typical species described by H. MILNE-EDWARDS and should be considered at least as a variety, not yet recognized as such and for which I propose the name of *robusta*.

A detailed description of *L. maculatus* Thallw. shall be published by me in my work on the Palaemonidae of the Kongo, because this collection contains two specimens taken at Banana in the mouth of the Kongo. I will here only remark that *L. maculatus* may be distinguished from the typical *L. longirostris* (H. M.-Edw.) especially 1° by the shape of the rostrum, 2° by the shorter ramus of the outer antennular flagellum and 3° by the measurements of the legs of the 2nd pair. Of the rostrum of *L. maculatus* the distal, toothless part of the upper margin is *longer*, only *one* tooth is situated on the carapace behind the orbit, the second being placed above the orbital margin, and the lower margin is always tridentate; in *L. longirostris* and the variety *robusta* constantly *two* teeth are situated on the carapace and the lower margin of the rostrum carries 3, 4 or 5 teeth. The shorter ramus of the outer antennular flagellum is fused to the longer *for half or a little more than half its length*, being coalesced until to the middle or to just beyond the middle, that of *L. longirostris* only *for one-third* of its length. The carpus, finally, of the 2nd pair of legs is constantly *a little more than one and a half* as long as the chela, whereas in *L. longirostris* carpus and chela are of equal or subequal length.

The specimens from the river Guadalquivir, that I consider to be the typical *L. longirostris*, now differ from the species living in the Hollandsch Diep and in the mouth of the Adour by the *less robust* outer appearance of the whole animal, by the *different* shape of the rostrum like also by *longer* and *more slender* legs.

According to MILNE-EDWARDS *L. longirostris* attains the length of 2 inches, according to HELLER the length of the body should be 2-3 inches; the last numbers are no doubt the correct ones, because the two largest specimens from Sevilla, though not yet egg-bearing and therefore perhaps not yet quite full-grown, are already 65 mm. long. The ova-bearing specimens of the variety *robusta* from the Hollandsch Diep are 70—75 mm. long, though already females long 44 or 45 mm. of this variety are provided with eggs; the male of this variety becomes 65—70 mm. long. The egg-bearing specimens of the variety *robusta* from the mouth of the Adour are 55 to 65 mm. long, of a somewhat smaller size than those of the Hollandsch Diep.

The main difference between the specimens from Sevilla and those of the variety *robusta* is presented by the *different* shape of the rostrum. MILNE EDWARDS does not speak about the rostrum, but the name given by him to this species, does render it probable that the rostrum is longer than that of *L. squilla*, with which he compares his species in his above cited diagnosis: HELLER, however, in his Key for the determination of the species (l. c. p. 262) emphasizes that the rostrum is *considerably longer* than the antennal scales. Of the two largest females from Sevilla, long 65 mm., the rostrum reaches 3 mm. beyond the antennal scales when looked

A

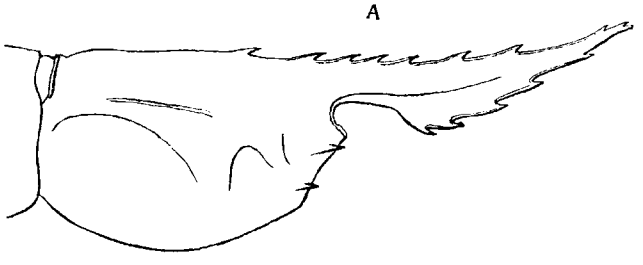

Fig. A. Female, long 65 mm., of *Leander longirostris* (H. M.-Edw.) from Sevilla, N° 1 of the Tables. × 2,6.

B

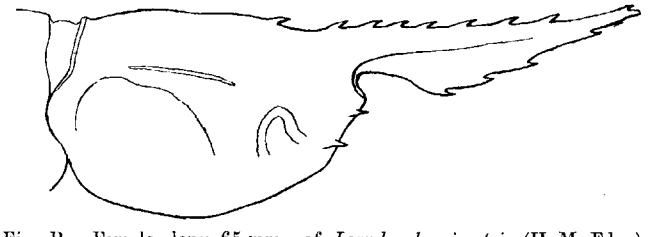

Fig. B. Female, long 65 mm., of *Leander longirostris* (H. M.-Edw.) from Sevilla, N° 2 of the Tables. × 2,6.

at from above, but almost 4 mm. in a lateral view, in the younger specimens $2^1/_2$ mm. or $1^1/_2$ mm. The rostrum of the Sevilla specimens (Fig. A and B) presents a *more slender* shape than that of the specimens from the Hollandsch Diep or from the mouth of the Adour, because it is *less high* in proportion to its length, the latter measured in a straight line from the middle of the orbital margin to the apex. In the seven specimens from Sevilla the proportion between the length and the height varies from 3,7 to 4; in 19 specimens from the Adour it ranges from 2,9 to 3,4, usually 3,1 or 3,3, in 24 specimens from the Hollandsch Diep, egg-bearing or not, from 2,7 to 3,5, usually 3 or 3,1, more rarely 2,8; 2,9 or 3,2. In all the specimens from Sevilla the rostrum runs almost

TABLE A, indicating the measurements (in mm.) for 7 specimens of the 43 specimens of the variety *robusta* de Man

	1	2	3	4	5	6	7	8	9
Length of the rostrum	15,5	15	13	12,75	11,5	11,25	11	13,9	13,9
Height of the rostrum.	4	3,75	3,5	3,33	3	2,9	2,9	4,1	4,5
Proportion between length and height	*3,9*	*4*	*3,7*	*3,8*	*3,8*	*3,9*	*3,8*	*3,4*	*3,1*

	26	27	28	29	30	31	32	33	34
Length of the rostrum	9,75	15,4	14,6	14,6	14	13,8	13,5	13,3	13,2
Height of the rostrum.	3	5,25	4,5	4,25	4,5	4,9	4,3	4,5	4,5
Proportion between length and height	*3,25*	*2,9*	*3,2*	*3,4*	*3,1*	*2,8*	*3,1*	*3*	*3*

N° 1 *L. longirostris* (H. M.-Edw.), Paris Museum; N° 2—7 *L. longirostris* (H. M.-Edw.), mouth of the Adour, N° 8—14 ova-bearing specimens, N° 15—26 specimens without eggs; Diep, N° 27—37 ova-bearing specimens, N° 38—50 specimens without eggs.

TABLE B, indicating the length of the body, the rostral formulae and both of the typical *Leander longirostris*

		1	2	3	4	5	6	7	8
Length of the body		65	65	57	56	51	51	66	65
Rostral formulae		$\frac{2}{7}+2$ / 5	$\frac{2}{8}+1$ / 4	$\frac{2}{7}+2$ / 4	$\frac{2}{7}+2$ / 4	$\frac{2}{8}+1$ / 4	$\frac{3}{8}+2$ / 4	7+1 / 3	7+2 / 3
Length of the carpus	of the legs of the 2nd pair	9	8	8,9	7	5,5	Legs of the second pair are wanting	8,7	9
Distal width of carpus.		1,08	0,9	1,06	0,8	0,68		1,2	1,2
Proximal width of carpus		0,64	0,55	0,64	0,5	0,46		0,7	0,68
Proportion between the length and the distal width		*8,3*	*9*	*8,4*	*8,7*	*8,1*		*7,2*	*7,5*
Proportion between the distal and the proximal width of the carpus . . .		1,7	1,6	1,7	1,6	1,5		1,7	1,7
Length of the chela.		9	8	9,8	7,2	6,25		9,9	10
Breadth of the chela		1,32	1,1	1,36	1,06	0.92		1,38	1,5
Proportion between length and breadth		6,8	7,3	7,2	6,8	6,8		7,2	6,6
Length of merus	of the legs of the 5th pair	8,7	9	8,2	7,5	7,1	7	8,4	8
Width of merus.		0,62	0,58	0,6	0,54	0,48	0,48	0,74	0,78
Proportion between length and width		*14*	*15*	*13,6*	*14*	*14,8*	*14,6*	*11*	*10,2*
Length of carpus		5,5	5,6	4,6	4,3	4	3,9	5,2	4,8
Breadth of carpus.		0,46	0,5	0,48	0,42	0,37	0,34	0,58	0,6
Proportion between length and breadth of the carpus		*12*	*11*	*9,6*	*10*	*11*	*11*	*9*	*8*
Length of propodus		9,3	9,5	8,5	8	7,25	7,25	9,2	8,7
Breadth of propodus.		0,38	0,42	0,42	0,34	0,35	0,3	0,52	0,5
Proportion between length and breadth of propodus.		*24*	*23*	*20*	*24*	*21*	*24*	*18*	*17*
Length of dactylus		3,1	3,5	2,75	2,9	2,6	2,5	2,8	2,6

N° 1—6 the typical species of *L. longirostris* (H. M.-Edw.) from Sevilla, N° 1 Paris Museum, (H. M.-Edw.); N° 7—10 females from the mouth of the Adour, N° 7—9 ova-bearing, above St. Jean de Luz; N° 12—25 specimens from the Hollandsch Diep, N° 12—14 males,

typical species of *Leander longirostris* (H. M.-Edw.) from Sevilla and for from the Adour and the Hollandsch Diep.

10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
13,75	13,5	13,3	11,5	11,4	13	12,25	11,5	10,8	10,75	10,6	10,5	10,25	10,25	10,2	10
4,25	4,5	4,25	4	3,75	4,1	3,9	3,4	3,25	3,2	3,5	3,3	3,1	3,1	3,25	3,1
3,2	*3*	*3,1*	*2,9*	*3*	*3,1*	*3,1*	*3,4*	*3,3*	*3,3*	*3*	*3,2*	*3,3*	*3,3*	*3,1*	*3,2*

35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
13	11,75	11,75	17	15,5	15,2	14,8	14	13,8	13,75	13,6	13,4	12,7	12,6	12,6	12
3,9	4	4	5,1	4,4	4,9	4,9	4,9	4,4	4,9	4,25	4,2	4,75	4,2	4,1	4
3,3	*2,9*	*2,9*	*3,3*	*3,5*	*3,1*	*3*	*2,8*	*3,1*	*2,8*	*3,2*	*3,2*	*2,7*	*3*	*3*	*3*

Museum at Vienna; N° 8—26 *L. longirostris* (H. M.-Edw.) var. *robusta* de Man, from the N° 27—50 specimens of *L. longirostris* (H. M.-Edw.) var. *robusta* de Man from the Hollandsch

the measurements of the legs of the 2nd and of the 5th pair of specimens (H. M.-Edw.) and the variety *robusta*.

9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
56	52	54	64	64	55	71	71	70	82	65	62	62	62	61	61	61
$\frac{7+1}{3}$	$\frac{7+2}{4}$	$\frac{7+1}{3}$	$\frac{\frac{2}{7}+2}{4}$	$\frac{\frac{2}{7}+2}{3}$	$\frac{\frac{2}{9}}{4}$	$\frac{\frac{2}{7}+2}{4}$	muti-lated	$\frac{\frac{2}{7}+1}{4}$	$\frac{\frac{2}{8}+3}{5}$	$\frac{\frac{2}{10}}{4}$	$\frac{\frac{2}{7}+2}{4}$	$\frac{\frac{2}{9}}{4}$	$\frac{\frac{2}{8}}{4}$	$\frac{\frac{2}{7}+2}{4}$	$\frac{\frac{2}{7}+2}{4}$	$\frac{\frac{2}{9}}{4}$
7	5,7	6,9	7	6,1	5,5	7,6	7,1	9,5	10	8,1	6,5	7	7,6	7	7	6,5
0,96	0,8	0,97	0,96	0,98	0,8	1,14	1,08	1,24	1,38	1,28	1	1,12	1,2	1,06	1,08	1,06
0,58	0,44	0,55	0,6	0,6	0,52	0,72	0,72	0,7	0,82	0,78	0,64	0,72	0,72	0,64	0,66	0,66
7,3	*7,1*	*7,1*	*7,3*	*6,2*	*7*	*6,6*	*6,6*	*7,6*	*7,2*	*6,3*	*6,5*	*6,25*	*6,3*	*6,6*	*6,5*	*6,1*
1,65	1,8	1,8	1,6	1,6	1,5	1,6	1,5	1,7	1,7	1,6	1,6	1,5	1,7	1,7	1,6	1,6
8	6,7	7,6	8,1	7,8	6,8	9,3	8,6	10,25	11,4	9,8	7,5	8,4	9	8	8,5	7,5
1,22	1	1,18	1,22	1,12	1	1,36	1,2	1,45	1,52	1,42	1,16	1,3	1,36	1,26	1,32	1,2
6,55	6,7	6,4	6,6	7	6,8	6,8	7	7	7,5	7	6,5	6,4	6,6	6,3	6,4	6,2
7,1	6,4	6,8	7,5	8	7	9,3	8,5	9	10	8,4	7,4	8	8	8	8	8
0,67	0,6	0,57	0,7	0,78	0,63	0,88	0,8	0,84	0,88	0,82	0,75	0,8	0,78	0,72	0,72	0,76
10,6	*10,7*	*12*	*11*	*10*	*11*	*10,6*	*10,6*	*11*	*11*	*10*	*10*	*10*	*10*	*11*	*11*	*11*
4,2	3,8	4,3	4,6	4,5	4	5,1	5,25	5,5	6	5	4,5	4,6	4,7	4,8	4,5	4,6
0,49	0,48	0,5	0,6	0,62	0,5	0,62	0,7	0,64	0,68	0,66	0,59	0,6	0,66	0 6	0,58	0,6
8,6	*7,9*	*8,6*	*7,7*	*7,2*	*8*	*8,2*	*7,5*	*8,6*	*8,8*	*7,6*	*7,6*	*7,6*	*7*	*8*	*7,7*	*7,7*
8	7,1	7,4	7,8	8,3	7,1	9	8,8	10	11,5	9,5	8,3	8,5	8,7	8,5	8,5	8,7
0,42	0,42	0,4	0,5	0,48	0,41	0,6	0,61	0,54	0,64	0,54	0,51	0,46	0,56	0,52	0,46	0,5
19	*17*	*18,5*	*15,6*	*17*	*17*	*15*	*14,4*	*18*	*18*	*17,5*	*16*	*18*	*15,5*	*16*	*18*	*17,4*
2,8	2,5	2,5	3,2	3	2,7	3,5	3	3,2	4	3,5	2,8	3	3	3	3	3

N° 2—5 Museum at Vienna; N° 7—25 specimens of the variety *robusta* of *L. longirostris* N° 10 without eggs; N° 11 specimen from brackish water of the river Nivelle, 2 kilometers N° 15—17 ova-bearing females, N° 18– 25 females without eggs.

horizontally forward until to the middle or to the end of 3rd antennular article, while the remaining distal part is directed obliquely upward, and HELLER also remarks „dass das Rostrum gegen die Spitze hin aufwärts gebogen ist"; this distal part, however, appears *more narrow*, *more slender* and *more strongly tapering towards the apex* than in the specimens from the Hollandsch Diep or from the mouth of the Adour. As regards the toothing of the rostrum the specimens from Sevilla fully agree with those of the variety *robusta*.

Besides by the rostrum the typical species differs from the variety *robusta* by *longer* and *more slender* peraeopods. MILNE-EDWARDS says that the legs of the last pair extend a long way (dépassent de beaucoup") beyond the antennal scales. In the specimens from the Hollandsch Diep, of the variety *robusta*, the legs of the 5th pair of the male extend only by half the dactylus or by the whole of this joint, those of the female by the dactylus and a very small fraction of the propodus beyond the antennal scales (J. G. DE MAN, l. c. p. 161), while in the egg-bearing females from the Adour, that are only 55—65 mm. long, these legs extend beyond the scaphocerites at the utmost by the dactylus. Of a female, long 65 mm. from Sevilla, on the contrary, the legs of the 5th pair extend by the dactylus and *one-third* of the propodus beyond the antennal scales, in the other female of the same size and in two younger specimens by *one-fourth* and in two females, respectively 57 mm. and 52 mm. long, even by *two-fifths* of the propodus.

The typical *L. longirostris*, however, not only differs from the variety by longer legs, but the legs are moreover *thinner* and *slenderer*, which is proved by the Table B. As regards the second pair the carpus has a *more slender* shape, the proportion, indeed, between the length of this joint and the thickness at the distal extremity varies from 8,1 to 9 in the specimens from Sevilla, on an average 8,5, in the variety *robusta* from 6,1 to 7,6, the average number being 6,6. In the same manner the proportion between the length and the width of the merus, carpus and propodus of the legs of the 5th pair is indicated in the typical species by larger numbers than in the variety.

The rostral formulae of six specimens from Sevilla are indicated in the Table B, of the 7th specimen, which is 51 mm. long, the formula is $\frac{2}{8}+\frac{2}{4}$. According to HELLER the accessory antennular ramus should reach far beyond the extremity of the rostrum („überragt jedoch die Schnabelspitze bedeutend"), in the specimens from Sevilla this is not the case. In one of the two specimens long 65 mm., in the specimen long 56 mm. and in one of the three that measure 51 mm., the accessory antennular ramus reaches in a lateral view just as far forward as the rostrum, in the other specimen long 65 mm. it extends half a millimeter, in a specimen long 51 mm. one millimeter and in the female long 57 mm. one and a half millimeter beyond the tip of the rostrum. In no one of these specimens it

consequently reaches far beyond the apex of the rostrum and these specimens prove moreover that the length of that part of the ramus, which reaches beyond the apex, varies rather much: this variability has already previously been demonstrated by me for *Leander serratus* (l. c. page 170), so that it cannot be used as a specific character. The accessory antennular ramus measures two-thirds the length of the peduncle, in not a single specimen it is longer.

It appears to me probable that the variety *robusta* will afterwards prove to be a good species, very closely related, especially as regards the measurements of the legs, but nevertheless specifically distinct from *L. longirostris* (H. M.-Edw.): for the present, however, I wish to consider it as a variety, because of the typical species no males or full-grown egg-bearing females could be examined and because the examined specimens have not been taken in the Garonne.