

On the Amphipod Genus *Talitrus*, with a description of a new species from the Scilly Isles, *T. dorrieni* n. sp.

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With Plates I-III and 5 Figures in the Text.

INTRODUCTION.

DURING the winter of 1924-25 some living specimens of a terrestrial sand-hopper were sent by Major A. A. Dorrien-Smith, D.S.O., Governor of the Isles of Scilly, to Mrs. E. W. Sexton of the Plymouth Laboratory. The specimens, which were handed over to the writer by Mrs. Sexton, have proved on examination to belong to a new species, which is described below and given the name *Talitrus dorrieni*.

According to information received with the specimens the species has a truly terrestrial habitat: it is found living among the moist humus and under dead leaves in the gardens of Tresco Abbey.

In the course of examining the literature of the already described species of the genus *Talitrus* Latreille and the genus *Talitriator* Methuen, evidence has been accumulated which warrants the abandonment of the latter genus. Discussion of this and other supporting evidence, a reconstitution of the genus *Talitrus* and a key to the identification of the species form the first part of this paper, description of the new species being reserved till last.

DISCUSSION.

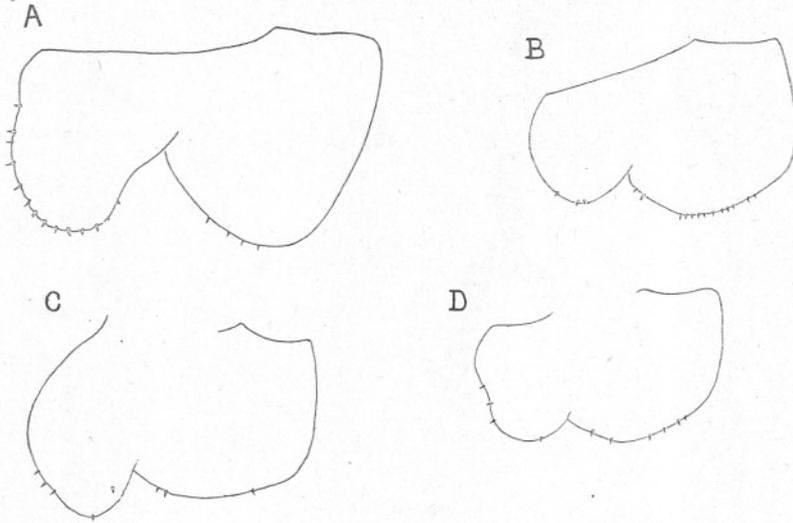
The genus *Talitrus* was instituted by Latreille in 1802 to receive, along with forms since removed from the genus, the European littoral species now known as *Talitrus saltator* (Montagu). Subsequently described species are *T. gulliveri* Miers, 1876 (8), from the Island of Rodriguez, presumably littoral; *T. sylvaticus* Haswell, 1879 (6), from New South Wales, terrestrial; *T. alluaudi* Chevreux, 1896 (3), from the Seychelles Is. and from European hot-houses, terrestrial; *T. kershawi* Sayce, 1909 (10), from Victoria, terrestrial; *T. hortulanus* Calman, 1912 (2), from Kew Gardens, terrestrial.

In 1913 Methuen (7) described a new genus and species, *Talitriator*

eastwoodae, for specimens of a terrestrial sand-hopper from Natal. Barnard, 1916 (1), accepted the new genus and transferred to it the two Australian species, *Talitrus sylvaticus* and *T. kershawi*. Finally, Stebbing in 1917 (12), while accepting Methuen's genus, shewed that the species was identical with the *Talorchestia africana* of Spence Bate, and renamed it accordingly *Talitriator africanus* (Bate).

The definition of the genus given by Barnard is as follows:—

“Like *Talitrus*, but with anterior lobe of 5th side-plate much larger than the posterior lobe, 1st antenna only slightly shorter than peduncle



TEXT FIGURE 1.—5th side-plates of A, *Talitrus saltator*; B, *T. dorrieni*; C, *T. africanus*; D, *T. alluaudi*.

of 2nd antenna, palp of maxilliped 4-jointed, 1st gnathopod not so long as 2nd gnathopod and not stronger, 5th joint of 1st gnathopod distally expanded, 2nd joint of 3rd peræopod moderately or scarcely at all expanded, telson longer than broad.”

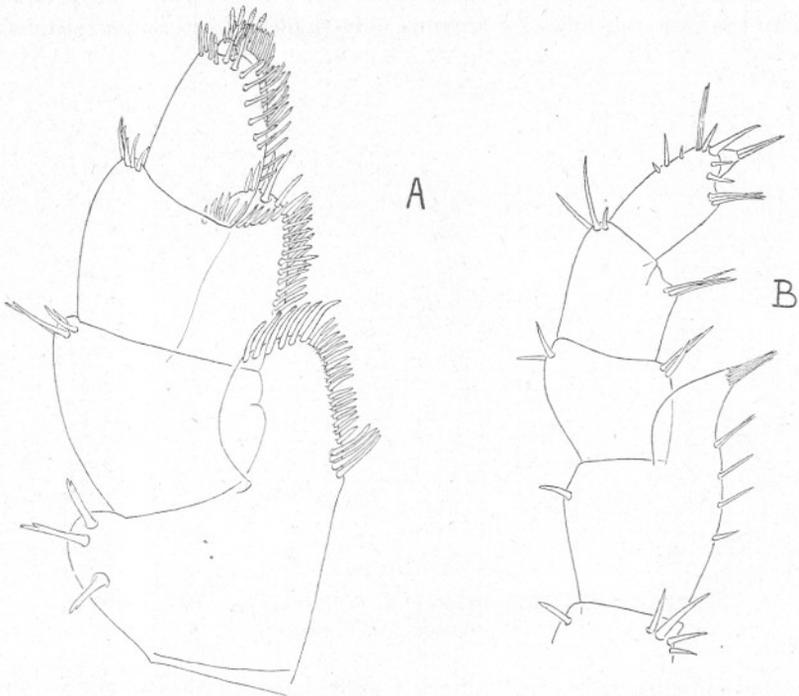
This definition will, however, include also *Talitrus alluaudi* Chev., *Talitrus hortulanus* Calman and *Talitrus dorrieni* n. sp. The characters given by Barnard, in fact, with the addition of one other, namely, *degradation of the pleopods*, are common to all the terrestrial species, and if these characters be of generic value the terrestrial species should be united under the genus *Talitriator*, leaving the genus *Talitrus* for the 2 littoral species.

As generic characters, however, they are not satisfactory. In the following examination they may be treated in the order given by Barnard.

Sar's figure of the 5th side-plate of *Talitrus saltator* (*T. locusta* Sars, 9),

on which Barnard relies for his comparison with the first character in his diagnosis, is, as Stebbing (12) points out, misleading. The accompanying figures of the 5th side-plates of *T. saltator* and other species shew the invalidity of this character (Text Fig. 1).

The second character given, the comparative length of the 1st antenna, provides a constant distinction, though varying in degree. In *T. sylvaticus*, *T. kershawi* and *T. dorrieni* the 1st antenna reaches the middle of the



TEXT FIGURE 2.—Maxilliped-palp and outer-plate of A, *Talitrus saltator* ;
B, *T. dorrieni*.

last joint of the peduncle of the 2nd antenna. In *T. alluaudi* and *T. hortulanus* it reaches beyond the middle of, and in *T. africanus* to the end of the last joint of the peduncle of the 2nd antenna.

The third character is not distinctive and varies considerably in degree. Careful examination of the maxilliped palp of *T. saltator* has revealed the presence of a minute, terminal, seta-bearing tubercle, representing the 4th joint, almost hidden by the dense rows of spines on the end of the 3rd joint (Text Fig. 2, A). The maxilliped palp of *T. alluaudi* is so minute that, up to the present, it had escaped unnoticed. The writer has examined and dissected specimens of *T. alluaudi* from the Seychelles,

kindly supplied by Dr. Louis Fage of the Paris Museum. Text Fig. 3 shews the minute but quite distinct 4th joint of the maxilliped palp in this species. In *T. kershawi* and *T. hortulanus* the minute 4th joint of the maxilliped palp is obscurely marked off from the 3rd joint. The number of joints in the maxilliped palp does not, therefore, provide a distinctive character. The maxillipeds of *T. saltator*, however, present a distinctive character not previously emphasized, in the much greater proportionate breadth of the palp segments and in the very different nature of their spination (Text Fig. 2.)



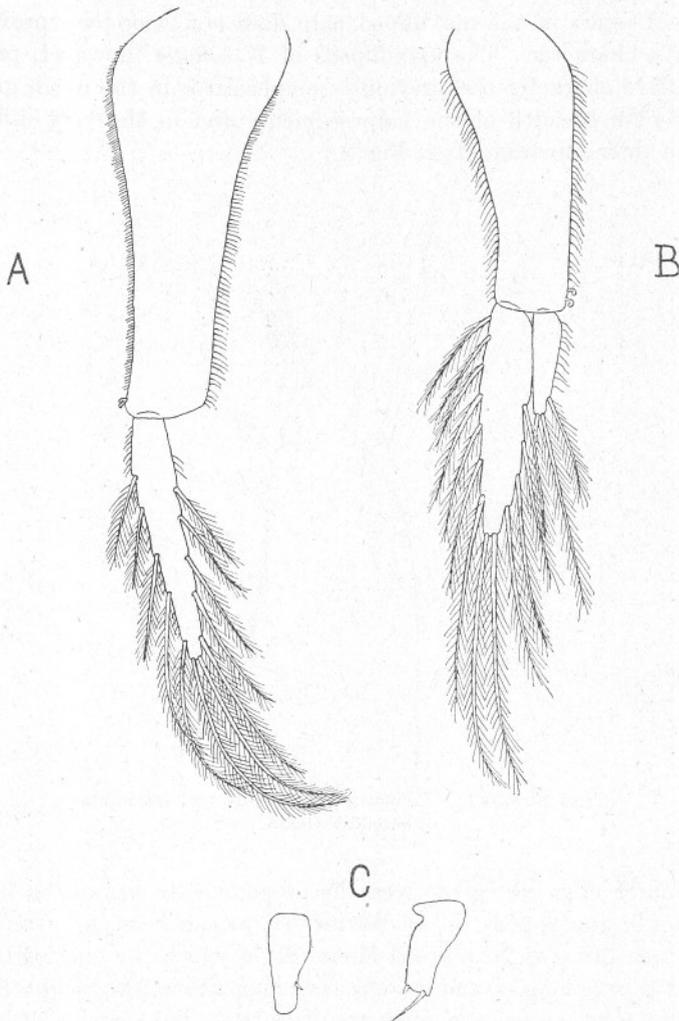
TEXT FIGURE 3.—*Talitrus alluaudi*: 3rd and 4th joints of maxilliped palp.

The fourth character given, viz. the proportionate size of the 1st and 2nd pairs of gnathopods, is not distinctive, as can be seen on reference to the description of *T. gulliveri* Miers (8), in which the 2nd gnathopod is stated to be as long as, and in some cases longer than, the 1st gnathopod.

The last three characters given are distinctive, but scarcely of generic rank.

All the terrestrial species shew a reduction in the size and development of the pleopods. This is most marked in *T. kershawi*, in which those of the 1st pair are very small and uniramous, those of the 2nd vestigial, without rami, while the 3rd pair is absent. The degradation is least marked in *T. hortulanus* and *T. africanus*, in which all three pairs are present and biramous, though—especially the 3rd pair—reduced in size.

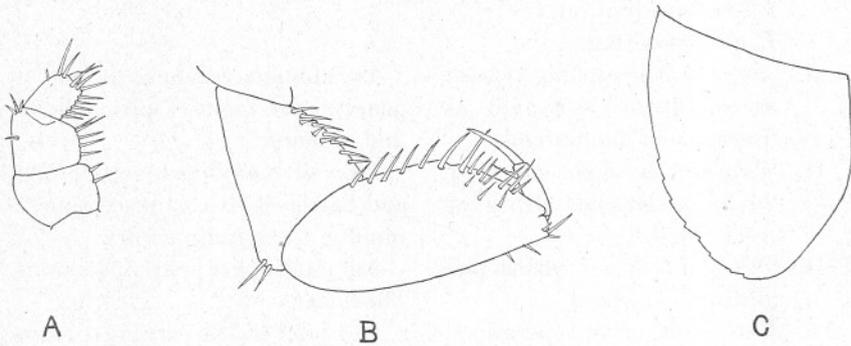
In *T. dorrieni*, *T. sylvaticus* and *T. alluaudi* the 3rd pair is reduced to vestigial stumps, without rami, while the three species respectively shew successive stages in the degradation of the 1st and 2nd pairs.



TEXT FIGURE 4.—*Tabitrus sylvaticus*: A, 1st pleopod (outer ramus missing); B, 2nd pleopod; C, 3rd pair of pleopods.

There is a discrepancy in the published accounts of the pleopods of *T. sylvaticus* to which reference must be made as it concerns the specific significance which in this paper is attached to the characters of the pleopods. Calman (2) first drew attention to this discrepancy, and

Chilton (5) has further referred to it in a note on the species. Sayce's description states that the 3rd pair of pleopods is absent, whilst Chevreux (4), who examined Tasmanian specimens sent to him by Chilton, states that the pleopods of the 3rd pair resemble those of the 1st two pairs in being biramous, though of smaller size. Chevreux, moreover, figures the 1st pair, and his figure is quite different from that of Sayce (10). Calman examined specimens from the Australian Museum and did not, as Chilton wrongly states, confirm Chevreux's description. On the contrary, he states that the 3rd pair consists of minute vestigial stumps, without rami and small enough to have been possibly overlooked by Sayce. By courtesy of Dr. Calman I have been able to examine his preparations of the pleopods of this species and these are figured above (Text Fig. 4.) The 1st and 2nd pairs are as described by Sayce, the 3rd pair as described



TEXT FIGURE 5.—Specimen (not *Talitrus sylvaticus*) labelled *Talitrus sylvaticus*, Tasmania, in collection of M. Chevreux. A, maxilliped-palp; B, 1st gnathopod; C, epimeral plate of 2nd pleon segment.

by Calman. Further, through the kindness of Dr. Louis Fage of the Paris Museum, I have been able to examine a specimen, labelled *Talitrus sylvaticus* from Tasmania, ex collection M. Chevreux. Although unable to dissect this specimen, I can state definitely that it does not belong to the species in question, if indeed to the genus *Talitrus* (Text Fig. 5.) The 1st gnathopod is subcheliform with an oblique palm, the shape of the 2nd pleon segment is very different from that of any *Talitrus*, all 3 pairs of pleopods are present and biramous and apparently well developed, though too small to describe properly without dissection. The palp of the maxilliped is distinctly 4-jointed, but the form of the palp differs considerably from that in *T. sylvaticus* as regards shape, proportion and spination. The specimen is a female and may possibly belong to the genus *Parorchestia*. It seems probable, therefore, that the specimen described by Chevreux was not *T. sylvaticus*, which would explain the discrepancy in question.

It remains to restate, in the light of the foregoing, the characters which distinguish the terrestrial forms (*Talitrus* and *Talitriator*) from the littoral forms (*Talitrus*).

The writer has not examined specimens of *Talitrus gulliveri* Miers. Miers' description is very incomplete, and there is no figure. The sex of the specimens is not stated, which leaves even the genus uncertain. It has been thought best, therefore, to exclude this species from the following table:—

TERRESTRIAL HABIT.	LITTORAL HABIT.
<i>Talitrus alluaudi</i> Chev.	<i>Talitrus saltator</i> (Mont.).
<i>T. hortulanus</i> Calman.	
<i>T. dorrieni</i> n. sp.	
<i>Talitriator sylvaticus</i> (Hasw).	
<i>T. kershawi</i> (Sayce).	
<i>T. africanus</i> (Bate).	
I. 1st antenna reaching at least to middle of last joint of peduncle of 2nd antenna.	1st antenna reaching to end of penultimate joint of peduncle of 2nd antenna.
II. Palp of maxilliped not very broad or flattened, 4th joint very small.	Palp of maxilliped very broad and flattened, 4th joint extremely minute, quite rudimentary.
III. 5th joint of 1st gnathopod distally expanded.	5th joint of 1st gnathopod stout but linear.
IV. 2nd joint of 3rd peræopod narrowing distally.	2nd joint of 3rd peræopod regularly expanded.
V. Telson longer than broad.	Telson broader than long.
VI. Pleopods either small or degraded.	Pleopods neither small nor degraded.

The last of these characters is the only one that might warrant generic separation, but seeing that the range of difference in the condition of the pleopods within the terrestrial group itself is so great, the writer ventures to suggest that the genus *Talitriator* be abandoned and the genus *Talitrus* be reconstituted to receive all the forms of both genera.

Genus TALITRUS Latreille.

In accordance with the above view a fresh diagnosis of the genus *Talitrus*, with a key to the identification of the species, is here given. The diagnosis is altered as little as possible from that given by Stebbing (11).

Diagnosis. Peræon dorsally broad, pleon compressed. Side-plate 1 narrow, 5th broad and deep. Antenna 1 not longer than peduncle of antenna 2. Antenna 2, basal joint or joints soldered to head, with no gland-cone, ultimate joint of peduncle the longest. Epistome forming

an obtuse angle with the upper lip. Upper lip distally rounded. Lower lip with tuft of setules at inner corner of principal lobes. Maxilla 1, palp minute, 1 or 2-jointed. Maxillipeds, palp 3-jointed or with minute, rudimentary 4th joint. Gnathopod 1 simple, 5th joint strong. Gnathopod 2 similar in both sexes, 5th joint expanded, 6th produced beyond a minute, chela-forming finger. Peræopods 4 and 5 with expansion of 2nd joint only. Branchial vesicles twisted or bent. Brood plates small, lanceolate. Pleopods sometimes more or less degraded. Telson simple.

KEY TO SPECIES.

- | | | | |
|----|---|--|-----------------------|
| 1. | { | 1st antenna scarcely reaching beyond end of penultimate joint of peduncle of 2nd antenna. Pleopods not small or degraded | 2 |
| | { | 1st antenna reaching at least to middle of last joint of peduncle of 2nd antenna. Pleopods small or degraded | 3 |
| 2. | { | 2nd antenna, peduncle stout | <i>T. saltator.</i> |
| | { | 2nd antenna, peduncle slender | <i>T. gulliveri.</i> |
| 3. | { | All 3 pairs of pleopods present and biramous, though small | 4 |
| | { | 3rd pleopod vestigial or absent | 5 |
| 4. | { | 2nd gnathopod not slender, shagreened expansion on under side of 4th joint | <i>T. africanus.</i> |
| | { | 2nd gnathopod slender, no shagreened expansion on under side of 4th joint | <i>T. hortulanus.</i> |
| 5. | { | 3rd pleon segment, antero-lateral border produced into acute triangular projection | <i>T. kershawi.</i> |
| | { | 3rd pleon segment, antero-lateral border evenly rounded | 6 |
| 6. | { | 1st and 2nd pleopods, inner ramus reduced to a mere vestige | <i>T. alluaudi.</i> |
| | { | 1st and 2nd pleopods, inner ramus at least more than $\frac{1}{2}$ as long as outer | 7 |
| 7. | { | 1st and 2nd pleopods, rami distinctly segmented, inner ramus the longer, outer border of peduncle clothed with long feathered setæ. | <i>T. dorrieni.</i> |
| | { | 1st and 2nd pleopods, rami not distinctly segmented, outer ramus the longer, outer border of peduncle clothed with short, simple hairs | <i>T. sylvaticus.</i> |

TALITRUS DORRIENI n. sp.

Plates I, II and III.

The number of specimens examined was 7, consisting of 2 males, 4 females and 1 immature.

Adult male : length 13 mm., colour dark reddish brown.

Head about $1\frac{1}{2}$ times as long as 1st peræon segment.

2nd, 3rd and 4th side-plates : posterior border with marked sub-acute projection.

1st pleon segment: posterior corner obtuse, hind margin rounded, serrulate.

2nd and 3rd pleon segments: posterior corner square, hind margin serrulate.

Eyes: round, black, rather large.

1st antenna reaching almost to middle of last joint of peduncle of 2nd antenna: ultimate and penultimate joints of peduncle subequal: flagellum about equal in length to peduncle, 7-jointed.

2nd antenna almost as long as head and peræon combined; peduncle, ultimate joint more than $1\frac{1}{2}$ times as long as penultimate; flagellum 31-jointed.

Maxilla: palp very minute, 1-jointed.

Maxillipeds: outer plate bluntly pointed, with tapering terminal bunch of long setæ; palp with minute 4th joint.

1st Gnathopods: 2nd joint as long as 3rd, 4th and 5th together; 5th as long as 3rd and 4th together, expanded distally to a breadth of more than $\frac{1}{2}$ its length, hinder distal border forming a conspicuous shagreened lobe; 6th joint tapering distally; finger, with claw, $\frac{1}{2}$ as long as 6th joint.

2nd Gnathopods: 2nd joint about as long as 4th and 5th together; 3rd and 4th joints subequal in length, shorter than 5th; hinder border of 4th, 5th and 6th joints produced as prominent, shagreened expansions, projecting distally in the 6th joint well beyond the small finger.

Peræopods: 1st peræopod longer than second; third peræopod about as long as 1st, 2nd joint narrowing distally, with hind margin straight, slightly crenulate; 4th peræopod much longer than 3rd, with 2nd joint evenly expanded, ovate, hind margin crenulate; 5th peræopod longer than 4th, with 2nd joint almost as broad as long, hind margin serrulate.

Pleopods: 1st and 2nd pleopods biramous, peduncles each with one pair of minute coupling-spines; 2nd pleopod slightly the longer and stouter, rami of both pairs distinctly segmented, with outer ramus 8-jointed, about as long as peduncle and slightly shorter than 9-jointed inner ramus, the rami and the outer margins of the peduncles fringed with long plumose setæ; 3rd pleopod reduced to vestigial stump, without rami.

Uropods: 3rd uropod more than $\frac{1}{2}$ as long as telson, peduncle and ramus each bearing one spine.

Telson longer than broad, dorsal surface arched anteriorly, hollowed laterally and posteriorly, 5 or 6 spines on each margin and 1 on each side of the truncate or faintly emarginate tip.

Adult female: length 15 mm., scarcely differing from male; 2nd antenna with peduncle less setose than that of male, flagellum 24-jointed;

3rd and 4th side-plates considerably larger in proportion to length of attached limb than in the male.

Immature: rami of pleopods 1 and 2 with fewer joints, pleopods otherwise not differing in type from those of adult.

REMARKS.

Talitrus dorrieni comes very close to *T. sylvaticus*, from which it would be hard to separate it but for the quite different form of the 1st and 2nd pleopods. Minor distinctions are present in the telson, which is more spinous; in the outer-plates of the maxillipeds, the tip of which bears a long, tapering tuft of setæ and not a transverse row of short bristles as in *T. sylvaticus*; in the 5th joint of the 1st gnathopod, which is prominently rather than minutely lobed; and in the palp of the maxilla, which is smaller and without trace of a second joint.

Barnard (1) cites a feature of *T. africanus*, which he regards as characteristic of the species, namely, the sub-acute projection of the hind margin of the 2nd side-plate. The writer has found this projection well marked in side-plates 2, 3 and 4 of *T. dorrieni* and *T. alluaudi*. It is clear but less well marked in *T. saltator*, and is well shewn in Calman's preparations of the 2nd gnathopod of *T. sylvaticus*. It occurs in *Orchestia littorea* and is probably a widespread feature in the Talitridæ.

In conclusion I would like to express my indebtedness to the kind interest of Mrs. E. W. Sexton, who has given much helpful advice and criticism.

LITERATURE CITED.

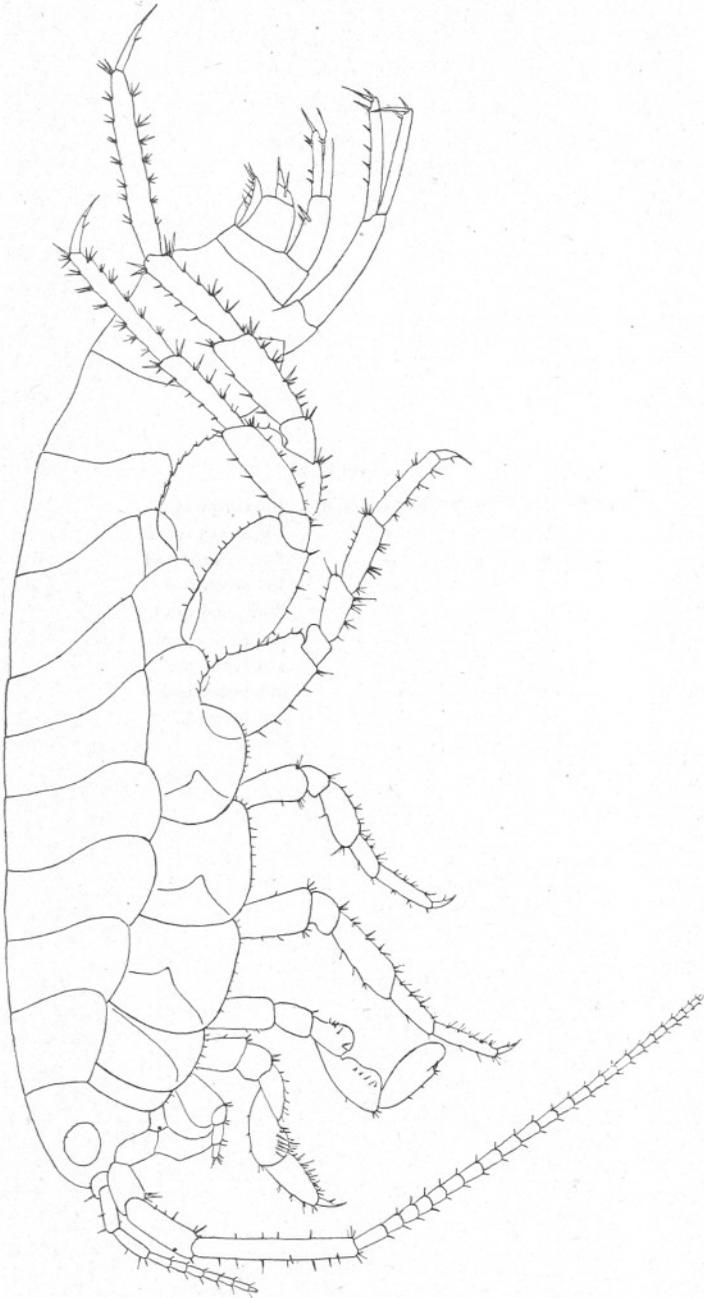
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EXPLANATION OF PLATES.

PLATE I.

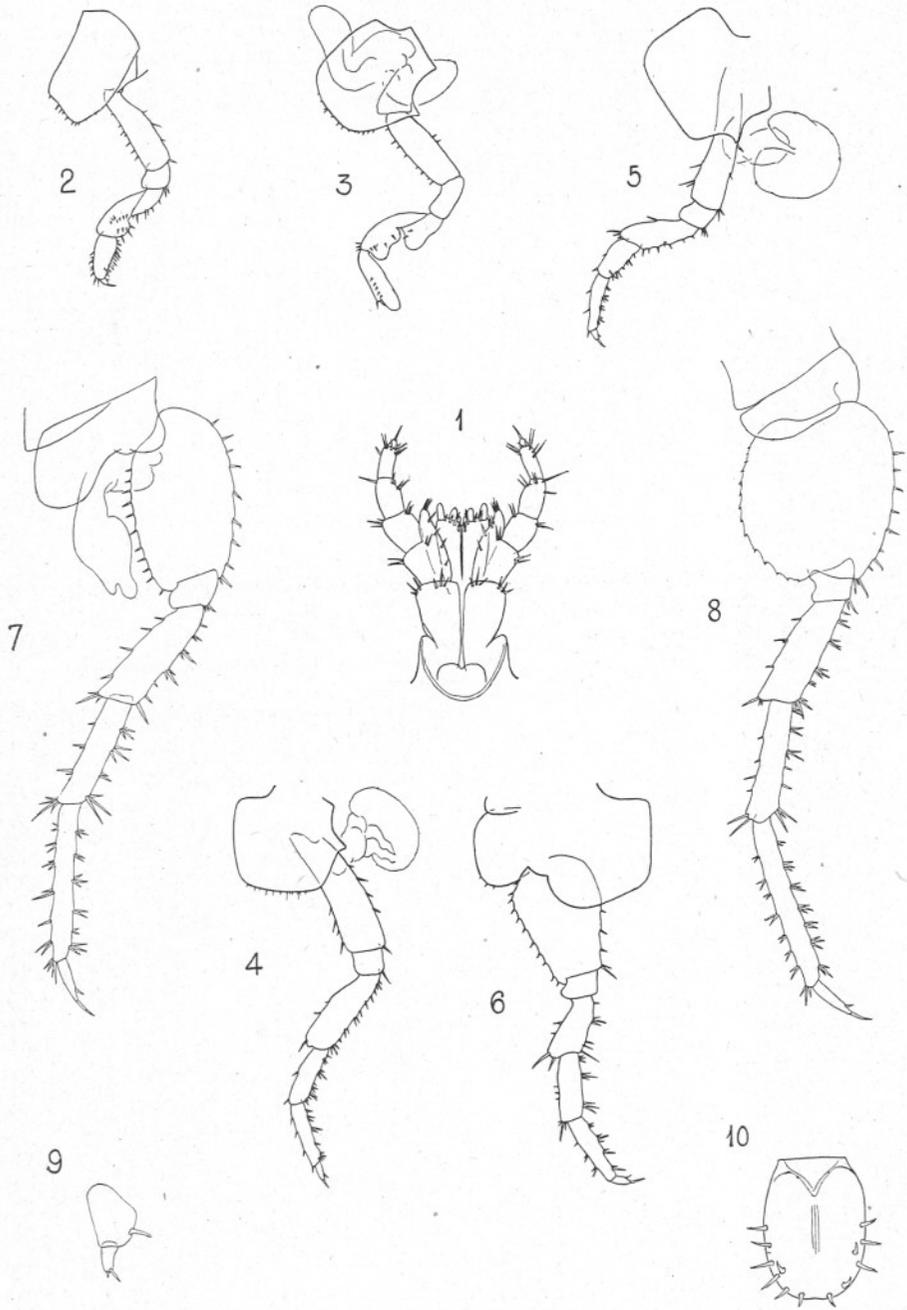
Talitrus dorrieni, n. sp. Adult female.



DEL. O. D. H.

PLATE II.

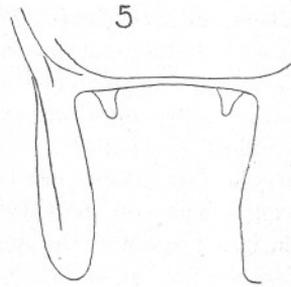
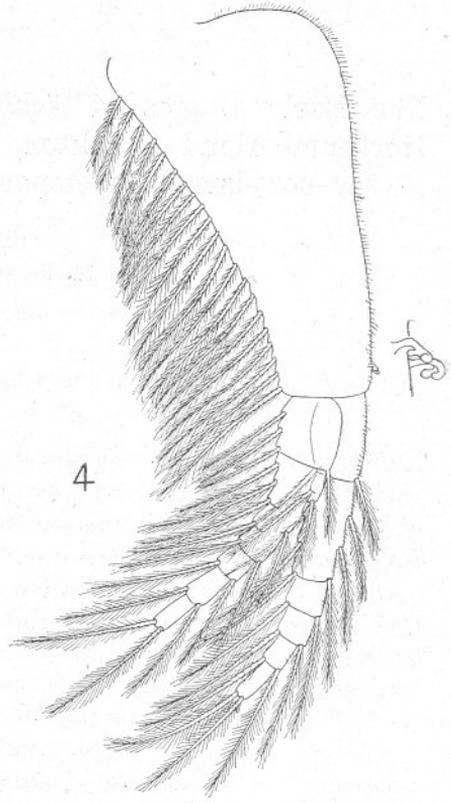
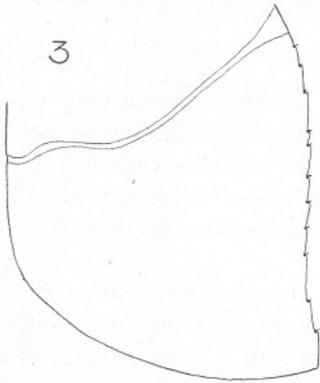
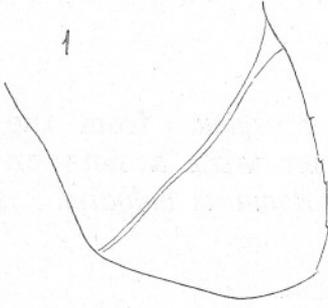
FIG. 1.	—	<i>Talitrus dorrieni</i>	n. sp.	maxillipeds.
”	2.	”	”	1st gnathopod.
”	3.	”	”	2nd gnathopod.
”	4.	”	”	1st peræopod.
”	5.	”	”	2nd peræopod.
”	6.	”	”	3rd peræopod.
”	7.	”	”	4th peræopod.
”	8.	”	”	5th peræopod.
”	9.	”	”	3rd uropod.
”	10.	”	”	telson.



DEL. O. D. H.

PLATE III.

- | | | |
|---------|---------------------------------|--|
| FIG. 1. | <i>Talitrus dorrieni</i> n. sp. | epimeral-plate of 1st pleon segment. |
| ” 2. | ” ” | ” ” 2nd ” ” |
| ” 3. | ” ” | ” ” 3rd ” ” |
| ” 4. | ” ” | 2nd pleopod (coupling spines shewn separately, enlarged). |
| ” 5. | ” ” | 3rd pleon segment shewing 3rd pair pleopods (anterior view). |



DEL. O. D. H.